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PART B
SOLAR - GEOPHYSICAL DATA

ISSUED
JANUARY 1960



U. S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS
CENTRAL RADIO PROPAGATION LABORATORY
BOULDER, COLORADO

National Bureau of Standards

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SOLAR - GEOPHYSICAL DATA

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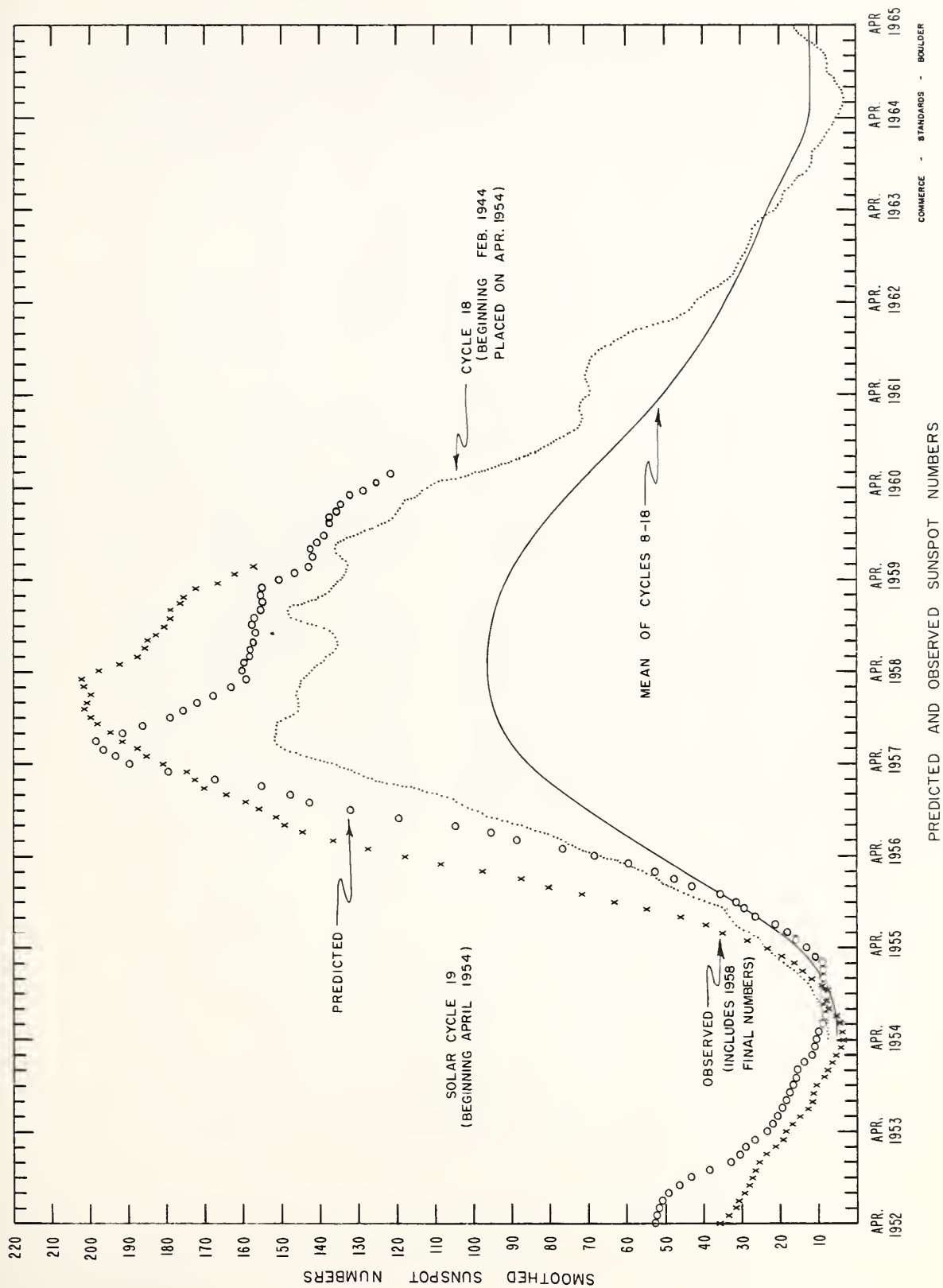
INTRODUCT ION

The descriptive text is published quarterly or whenever context of the report is changed. The last issue in which the text appeared was CRPL-F183 Part B issued November 1959.

DAILY SOLAR INDICES

Nov. 1959	American Relative Sunspot Numbers R_A
1	112
2	89
3	103
4	92
5	84
6	111
7	121
8	144
9	139
10	141
11	144
12	146
13	156
14	164
15	150
16	129
17	80
18	67
19	52
20	71
21	63
22	88
23	107
24	155
25	156
26	147
27	159
28	172
29	167
30	161
Mean:	122.3

Dec. 1959	Zürich Provisional Relative Sunspot Numbers R_Z	Daily Values Solar Flux at 2800 Mc, Ottawa, Canada Flux
1	142	222
2	150	217
3	171	202
4	190	199
5	126	204
6	147	202
7	136	191
8	129	193
9	94	173
10	70	174
11	82	171
12	71	169
13	59	162
14	88	165
15	123	171
16	113	164
17	107	167
18	111	169
19	114	180
20	110	178
21	103	185
22	121	171
23	106	166
24	108	163
25	110	...
26	95	161
27	132	167
28	114	172
29	135	171
30	127	179
31	153	167
Mean:	117.3	179.2



CALCIUM PLAGE AND SUNSPOT REGIONS

DECEMBER 1959

CMP Dec. 1959	Lat	McMath Plage Number	Return of Region	Calcium Plage Data				Sunspot Data		
				CMP Values Area Int.		History, Age		CMP Values Area Count		History
01.0	S21	5485	Ephem	(700)	(2.5)	b \wedge d		(20)	(1)	b \wedge d
01.5	N07	5476	5443	8500	4	ℓ - ℓ	8	2500	24	ℓ - ℓ
03.2	N25	5477	5446	4600	3	ℓ - ℓ	2	360	5	ℓ \searrow d
05.3	S08	5479	New	500	1.5	ℓ - ℓ	1			
05.6	N14	5478	New	6000	3	ℓ / ℓ	1	1670	15	ℓ - ℓ
06.3	N33	5480	5447	2100	2.5	ℓ \searrow ℓ	3			
08.2	N39	5488	New	1400	2	b \wedge d	1			
08.5	S18	5482	5452	10,000	3	ℓ \searrow ℓ	4	50	1	ℓ \searrow d
08.5	N16	5483	New	2600	3	ℓ - ℓ	1	190	6	ℓ \searrow d
09.2	N09	5484	5453	1700	2.5	ℓ - ℓ	4	300	4	ℓ - ℓ
10.9	S19	5486	5454	8100	2.5	ℓ \searrow ℓ	3			
10.9	N21	5487	5457	2600	2.5	ℓ - ℓ	5	50	2	b - ℓ
11.6	S26	5489	5454	(500)	(1.5)	ℓ - ℓ	3			
11.7	N06	5495	New	(200)	(2)	b / ℓ	1	(170)	(3)	b / ℓ
14.3	S05	5490	5459	1000	2	ℓ / ℓ	3,5	110	3	b / ℓ
15.2	N16	5491	New	5100	3.5	ℓ / ℓ	1	1240	2	ℓ \searrow ℓ
16.1	S18	5492	5459	2100	3	ℓ - ℓ	3,5	160	3	b \wedge d
17.4	N11	5493	5464	2200	2.5	ℓ - ℓ	5	220	3	ℓ \searrow ℓ
17.5	S06	5494	New	2300	3	ℓ - ℓ	1	410	1	ℓ \searrow ℓ
17.7	N28	5496	*	700	1.5	ℓ - ℓ	6			
19.4	N12	5497	5464	2900	2.5	ℓ - ℓ	5	290	3	ℓ \searrow d
20.2	S02	5499	5465	400	1	ℓ - ℓ	2			
21.9	N10	5501	5468	3000	3	ℓ - ℓ	3	750	10	ℓ - ℓ
22.1	S16	5500	5467	3100	3	ℓ - ℓ	3	340	2	ℓ - ℓ
23.5	N15	5502	5468	4600	2.5	ℓ / ℓ	3	450	6	ℓ \searrow ℓ
26.1	N21	5504	5471	(2900)	(3)	ℓ - ℓ	2	70	2	ℓ - ℓ
26.2	N09	5505	5471	(400)	(2)	ℓ / ℓ	2	590	7	b / ℓ
26.2	S18	5508	New	2000	2	b \nearrow ℓ	1	50	2	b \nearrow ℓ
27.8	N21	5506	5471	(2500)	(2.5)	ℓ - ℓ	2	170	3	b \nearrow ℓ
28.6	N08	5507	5476	(4500)	(2.5)	ℓ - ℓ	9	(10)	(1)	ℓ \searrow d
30.2	N24	5509	5477	1900	3	ℓ - d	3			
31.0	S09	5510	New	1500	2.5	b - ℓ	1	360	7	b \nearrow ℓ
31.2	S29	5518	New	700	1.5	b \wedge d	1			
31.7	N10	5511	5478	2300	2	ℓ - ℓ		240	1	ℓ - ℓ

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Plage histories uncertain December 22-30 because of no observations.
 * 5460, 5462.

CORONAL LINE EMISSION INDICES

DECEMBER 1959

CtP Dec. 1959	North East Quadrant (observed 7 days earlier)				South East Quadrant (observed 7 days earlier)				South West Quadrant (observed 7 days later)				North West Quadrant (observed 7 days later)			
	G ₆	G ₁	R ₆	R ₁	G ₆	G ₁	R ₆	R ₁	G ₆	G ₁	R ₆	R ₁	G ₆	G ₁	R ₆	R ₁
1	174	206	37	57	112	180	11	18	x	x	x	x	x	x	x	x
2	143	171	17	25	60	94	9	20	x	x	x	x	x	x	x	x
3	153	169	13	30	48	81	6	7	x	x	x	x	x	x	x	x
4	x	x	x	x	x	x	x	x	42	88	37	42	101	138	33	60
5	98	141	19	24	68	112	25	48	68	102	25	28	123	172	23	42
6	118	168	15	24	74	122	23	39	63	80	x	x	91	119	x	x
7	73	94	8	10	78	99	15	24	177	266	43	102	137	206	22	42
8	x	x	x	x	x	x	x	x	x	x	40a	87a	x	x	21a	30a
9	65	82	43	96	153	229	66	118	x	x	19	36	x	x	6	9
10	50	84	x	x	117	290	x	x	x	x	x	x	x	x	x	x
11	x	x	x	x	x	x	x	x	64	74	20	33	95	102	12	15
12	67	95	x	x	49	59	x	x	103	192	x	48	121	144	26	42
13	80	100	16	20	84	117	17	21	x	x	24	x	x	x	x	x
14	109	132	27	48	79	110	22	26	x	x	x	x	x	x	x	x
15	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
16	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
17	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
18	96	122	41	108	87	126	43	60	x	x	x	x	x	x	x	x
19	107	152	22	33	77	108	18	24	x	x	x	x	x	x	x	x
20	93	134	23	39	75	119	14	24	x	x	x	x	x	x	x	x
21	124	268	23	35	115	212	23	30	75	104	24	51	101	143	34	84
22	x	x	x	x	x	x	x	x	80	186	19	36	187	278	51	102
23	94a	140a	22	39	53a	62a	27	50	x	x	15	21	x	x	44	84
24	159a	231a	20	30	72a	83a	6	8	x	x	x	x	x	x	x	x
25	85	153	33	80	28	36	11	20	x	x	x	x	x	x	x	x
26	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
27	164	207	46	90	108	166	14	18	50	56	x	x	159	285	x	x
28	x	x	x	x	x	x	x	x	56	84	20	33	165	200	37	48
29	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
30	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
31	x	x	x	x	x	x	x	x	64	112	x	x	114*	138	x	x

x = no observations.

a = index computed from low weight data.

* = yellow line observed.

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CORONAL LINE EMISSION INDICES

(corrections to October and November 1959 values published in F183 and F184)

CMP 1959	North East Quadrant		South East Quadrant		South West Quadrant		North. West Quadrant	
	G6	G1	G6	G1	G6	G1	G6	G1
18 Oct					55 114 82 71 58	107 153 138 86 78	66 84 90 95 64	92 126 117 135 68
27								
28								
29								
30								
1 Nov								
3								
4								
10	105	200	78	111	86	120	115	208
11	90	140	124	164	57	88	122	161
12					59	100	182	198
13	130	175						
14	156	241	112	156				
15			104	159				
17	99	121	68	88	73	94	101	118
18	68	78	103	146				
19								
22	129	155	113	174	118	172	146	166
23					79	98	169	234
28	114	182	34	52	120	161	153	234
					127	194	127	221

SOLAR FLARES

DECEMBER 1959

OBSERVATORY	DATE	OBSERVED TIME		LOCATION			DURA- TION — MINUTES	IM- POR- TANCE	OBS. COND.	MEASUREMENTS				PROVISIONAL IONOSPHERIC EFFECT
		START	END	MAX. PHASE	APPROX.					MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg.	MAX. WIDTH H _o	MAX. INT. %	
					LAT.	MER. DIST.								
{ MITAKA WENDEL { SAC PEAK { MCMAH { SAC PEAK { LOCKHEED { MCMAH HAWAII	DEC 1959													
	01	0121	0200	N08 E04	5476	39	1	1	0123	.98	.99	4.10	107	SLOW S-SWF
	01	1208 E	1251 D	N09 W02	5476	43 D	16				8.00		28	
	01	1456 E	1622	N08 W05	5476	86 D	2	3		8.14			38	
	01	1527 E	1530 D	N09 W07	5476	3 D	1		1528		3.00		40	S-SWF
	01	1638	1946	N08 W05	5476	188	26	3		8.72				
	01	1639 E	2000	N08 W06	5476	201 D	2	2	1709	8.20				
	01	1648 E	1725 D	N11 W03	5476	37 D	26	3	1719		9.00			
	01	2306 E	2418	N12 W10	5476	72 D	1	2	2336	1.00	1.05			
	02	0721 E	0823	N08 W16	5476	62 D	16	2	0739			3.10		S-SWF
02	1051	1103 D	N07 W14	5476	12 D	16	2	1055			3.10			
02	1219 E	1412 D	N07 W16	5476	113 D	26				14.00				
{ WENDEL { WENDEL MCMAH HAWAII HAWAII	02	1219 E	1412 D	N09 W07	5476	113 D	26				13.00			S-SWF
	02	1459 E	1515 D	N11 W14	5476	16 D	1	2	1501		2.00			
	02	1756 E	1824	N12 W17	5476	28 D	1	3	1808	1.15	1.20			
	02	1840 E	2000	N13 W14	5476	80 D	1	2	1902	1.10	1.15			S-SWF
	03	0807 E	0826	N09 W30	5476	19 D	1	2			10.00			
	03	1010	1107	N09 W31	5476	57	2				7.00			
	03	1115	1152	N12 E27	5478	37	16				3.00			S-SWF
	03	1126	1154	N09 W32	5476	28	1				5.00			
	03	1408 E	1428 D	N10 W33	5476	20 D	16							
	{ LOCKHEED { HAWAII	03	1756	2000	N07 W35	5476	124	2	1	1804	5.70			40
03		1802 E	1946	N12 W31	5476	104 D	16	3	1815	2.10	2.50			
04		0032	0117	N07 W37	5476	45	2	1	0050	4.42	5.52	2.16	183	
{ MITAKA HAWAII MITAKA MITAKA MITAKA MITAKA MITAKA { LOCKHEED { SAC PEAK	04	0038 E	0103 D	N08 W42	5476	25 D	1	2	0044	1.65	2.05			S-SWF
	04	0120	0128	N08 W41	5476	8	1	1	0125	3.93	5.10	2.04	125	
	04	0208	0250	N08 E15	5478	42	16	1	0215	4.92	5.25	2.50	134	
	04	0353 E	0412	N07 W39	5476	19 D	16	1	0356	5.90	7.38	2.74	143	G-SWF
	04	0439	0442	N08 W41	5476	3	1	1	0440	.69	.88	3.38	100	
	04	0526 E	0532 D	S16 E54	5482	6 D	1	1	0526	2.95	5.75	1.69	107	
	04	1814	2100	N06 W45	5476	166	2	1	1823	6.80			30	S-SWF
	04	1824 E	2100 U	N07 W44	5476	156 D	26	3		12.88			32	
	05	0035	0048	N10 W01	5478	13	1	2	0035	3.93	4.01	2.50	120	
	05	0222 E	0232 D	N16 W31	5477	10 D	16	1	0223	4.41	5.25	1.68	120	S-SWF
05	0226 E	0234	N10 W02	5478	8 D	16	1	0230	5.90	6.02	2.78	149		
05	1004 E	1016	N11 W02	5478	12 D	1	2	1006	2.20	2.20				
{ LOCARNO LOCARNO LOCARNO { LOCKHEED { LOCKHEED { SAC PEAK { LOCKHEED LOCKHEED LOCKHEED	05	1230 E	1235 D	N12 W06	5478	5 D	2-	3						S-SWF
	05	1408	1430	N10 E02	5478	22	16	3						
	05	1422	1430	N09 W10	5478	8	1	3	1952	2.00			20	
	05	1938	2012	N11 W03	5478	34	1	1	1952	2.00			20	S-SWF
	05	1938	2012	N11 W03	5478	34	1	1	1952	2.00			22	
	05	2158	2218 D	N05 W10	5478	20 D	1	2	2202	3.40			20	
	05	2159	2221	N08 W12	5478	22	1	1	2202	2.30			10	S-SWF
	05	2220	2238	N03 W65	5476	18	1	1	2226	2.00			30	
	05	2341	2350 D	N10 W15	5478	9 D	1	1	2346					
	HAWAII LOCARNO LOCARNO LOCARNO	06	0008	0112 D	N13 W04	5478	64 D	1	2	0014	1.40	1.45		
06		0936	0955	N11 W19	5478	19	16	2	0939	3.00				
06		0936	0955	N07 W61	5476	19	1	2	0939	2.00				
06		1235	1245	N09 W08	5478	10	1	2	1236	1.00				

SOLAR FLARES

DECEMBER 1959

OBSERVATORY	DATE	OBSERVED TIME			LOCATION			DURA- TION — MINUTES	IM- POR- TANCE	OBS. COND.	TIME — UT	MEASUREMENTS			PROVISIONAL IONOSPHERIC EFFECT
		START	END	MAX. PHASE	APPROX.	LAT.	MER. DIST.					MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg.	MAX. WIDTH Ha	
	DEC 1959														
LOCARNO	06	1340	1348		N11 W14	5478		8	1	2					S-SWF
LOCARNO	06	1430	1443		N08 W18	5478		13	1	2	1437	2.00			
SAC PEAK	06	1716	1726		N09 W19	5478		12	1	2		2.18			
SAC PEAK	06	1902	1930		N12 W15	5478		28	1	2		3.05			
{ MITAKA	07	0434	0452	0439	N11 W20	5478		18	1	1	0439	2.95	3.25	5.79	
	07	0437	0513	D	N08 W27	5478		36	D	1	0454	1.97	2.09	2.94	
WENDEL	07	0936	1028	D	N11 W23	5478		52	D	1			9.00		
WENDEL	07	1228	1300	E	N12 W32	5478		32	D	16			6.00		
WENDEL	07	1318	1350		N13 W31	5478		32	1				3.00		
SAC PEAK	07	1630	1702		N12 W36	5478		32	1	2		3.32			
SAC PEAK	07	1852	1906		N13 W37	5478		48	U	1		3.41			S-SWF
SAC PEAK	07	2134	2216	D	N07 W38	5478		42	U	2		3.84			
{ SAC PEAK	07	2134	2216	D	N07 W38	5478		42	U	2		3.84			
	07	2136	2240	D	N13 W33	5478		64	D	2	2145	2.90	3.60		
MITAKA	08	0120	0145		N12 W38	5478		25	D	1	0120	3.93	5.11	3.89	
WENDEL	08	1204	1211	D	N16 W03	5483		7	D	1			4.00		
WENDEL	08	1251	1258	D	S17 E10	5482		7	D	1			3.00		
WENDEL	08	1317	1334		N29 E35	5487		17	1				3.00		
WENDEL	08	1405	1426		N29 E35	5487		21	D	1			4.00		
LOCARNO	09	1310	1330		N12 W54	5478		20	1	3	1358		1.00		S-SWF
ZURICH	09	1358	1403		N09 W06	5484		5	1	3					
LOCKHEED	10	2030	2056		N17 E54	5491		26	1	1	2038	2.40			
HAWAII	11	0028	0036		N18 W90	5477		8	D	1		.25			
WENDEL	11	1256	1330	D	N07 W77	5478		34	D	1	0028		3.00		
SAC PEAK	11	2118	2134		S02 E67	5494		16	1	2		2.10			
{ WENDEL	12	0812	0831		N17 E35	5491		19	1				3.00		
	12	0815	0823	D	N16 E33	5491		8	D	2					
ARCETRI	12	1140	1158	D	N10 E61	5493		18	D	1			3.00		
WENDEL	12	1305	1358	D	S19 W60	5482		53	D	16			8.00		
MCMATH	13	1529	1615		S22 W67	5482		46	1	1	1540		2.00		S-SWF
SAC PEAK	13	1932	2056		S18 W72	5482		84	1	2					
HUANCAYO	14	1532	1555		S18 E90	5500		23	D	2	1540	2.91		2.80	
WENDEL	15	0841	0901		N10 E59	5497		20	1				4.00		
WENDEL	15	0919	1046	D	N08 W82	5484		87	D	1			4.00		
LOCARNO	15	1030	1100		N10 E23	5493		30	D	2					
WENDEL	15	1031	1100	D	S11 E24	5494		29	D	1			4.00		
{ WENDEL	15	1120	1146	D	N16 W01	5491		26	D	1			3.00		
	15	1130	1145		N18 W01	5491		15	1	2					
LOCARNO	15	1238	1250		N27 E01	5491		12	1	2		1.00			S-SWF
{ WENDEL	15	1244	1303	D	N22 W01	5491		19	D	1	1245				
	15	1540	1555		S14 W01	5492		15	D	2	1545	4.10	3.00	1.80	
HUANCAYO	15	1540	1555		S14 W01	5492		15	D	2			4.20		
LOCARNO	16	0845	0920		N07 W64	5495		35	D	1			3.00		
WENDEL	16	0913	0937		N05 W63	5495		24	1	1			3.00		
WENDEL	16	1017	1042	D	N11 E41	5497		25	D	1			3.00		

SOLAR FLARES

DECEMBER 1959

OBSERVATORY	DATE	OBSERVED UNIVERSAL TIME		LOCATION		DURA- TION — MINUTES	IM- POR- TANCE	OBS. COND.	MEASUREMENTS				PROVISIONAL IONOSPHERIC EFFECT
		START	END	APPROX. LAT. DUR.	APPROX. MER. REGION				TIME — U T	MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg.	MAX. WIDTH Ha	MAX. INT. %
LOCARNO	16	1030 E	1055	N09 E42	5497	25 D	1	2					
LOCARNO	17	0914	0935	N12 E30	5497	21	1	3	0935	1.00			20
LOCKHEED	17	2155 E	2221	S09 W49	5490	26 D	1	1	2157	3.40			
LOCARNO	19	1055 E	1115	S02 W30	5494	20 D	16	3					
HAWAII	19	2142	2216	N22 E47	5502	34	1	3	2200	1.95	3.25		
CAPRI S	20	0835	0919 D	N19 E43	5502	44 D	1	3	0909	1.60	2.40		
ARCETRI	20	0931 E	0950 D	S17 E11	5500	19 D	1	2					
CAPRI S	20	1206 E	1234 D	S03 W43	5494	28 D	1	3	1214	1.80	2.30		
ZURICH	20	1422 E	1428	S09 W81	5490	6 D	1	2	1422		1.00		
MITAKA	21	0045 E	0104	S03 W53	5494	19 D	16	1	0053	7.86	12.50	3.21	137
HAWAII	21	0129 E	0154 D	S03 W55	5494	25 D	16	2	0145	2.05	3.45		
MITAKA	21	0148 E	0157 D	N28 E32	5502	9 D	1	1	0150	1.28	1.61	3.03	134
CAPRI S	21	1231	1242 D	N10 W16	5497	11 D	1	1	1238	2.00	2.00		
LOCARNO	22	1410	1420	N08 W08	5501	10	1	3					
HAWAII	23	0002	0024 D	N09 W11	5501	22 D	1	2	0010	1.70	1.80		
WENDEL	23	0918 E	0937	N24 E13	5504	19 D	1						
HUANCAYO	23	1640	1715	N23 W04	5502	35	1	2	1647	3.00	3.30	2.90	
MITAKA	25	0221 E	0245 D	N23 W23	5502	24 D	1	1	0230	3.93	4.72	3.37	134
WENDEL	25	1304 E	1313 D	S16 W55	5500	9 D	1						
CAPRI S	25	1304 E	1321 D	S19 W51	5500	17 D	1	2	1315	1.40	2.20		
LOCKHEED	26	1833	1906	N26 W47	5502	33	1	2	1837	2.30			20
LOCARNO	27	1148 E	1159	S18 W76	5500	11 D	2	2					
CAPRI S	28	1101 E	1116 D	N09 E45	5511	15 D	1	2	1104	1.80	2.40		
LOCARNO	28	1212	1225	N22 E62	5513	13	1	3					
LOCARNO	28	1240	1255	N12 E15	5507	15	1	3					
LOCARNO	29	1312	1322	N21 W55	5504	10	1	3					
LOCKHEED	29	1744	1840	N11 W49	5505	56	1	3	1750	2.40	1.15		30
HAWAII	29	2226	2236	S11 E11	5510	10	1	3	2230	1.15			
LOCARNO	30	0900 E	1020	N04 W87	5505	80 D	1	3					
ARCETRI	30	1016 E	1028 D	N11 W58	5505	12 D	1	3	1016	1.30	2.50		
LOCARNO	31	1022	1032	S09 W08	5510	10	16	2	1026	2.00			
AROSA	31	1027	1031	S10 W09	5510	4	1						

CAPRI G ANACAPRI - GERMAN
CAPRI S ANACAPRI - SWEDISH
GOOD HOPE ROYAL OBSERVATORY, CAPE OF GOOD HOPE
KIEV* KIEV UNIVERSITY
KODAIKANAL KODAIKANAL
KRASNAYA KRASNAYA PAKHRA
LOCKHEED LOS ANGELES

MOSCOW-G MOSCOW - CAISH
R O EDIN ROYAL OBSERVATORY, EDINBURGH
R O HERST GREENWICH ROYAL OBSERVATORY, HERSTMONCEUX
SAC PEAK SACRAMENTO PEAK
SCHAUMS SCHAUMS
USNRL UNITED STATES NAVAL RESEARCH LABORATORY

SAC PEAK: ALL VALUES IN MAX. INT. COLUMN ARE ARBITRARY UNITS (0-40), NOT PERCENT OF CONTINUOUS SPECTRUM.
E - LESS THAN & - PLUS
D - GREATER THAN - - MINUS
U - APPROXIMATE □ - NOT REPORTED

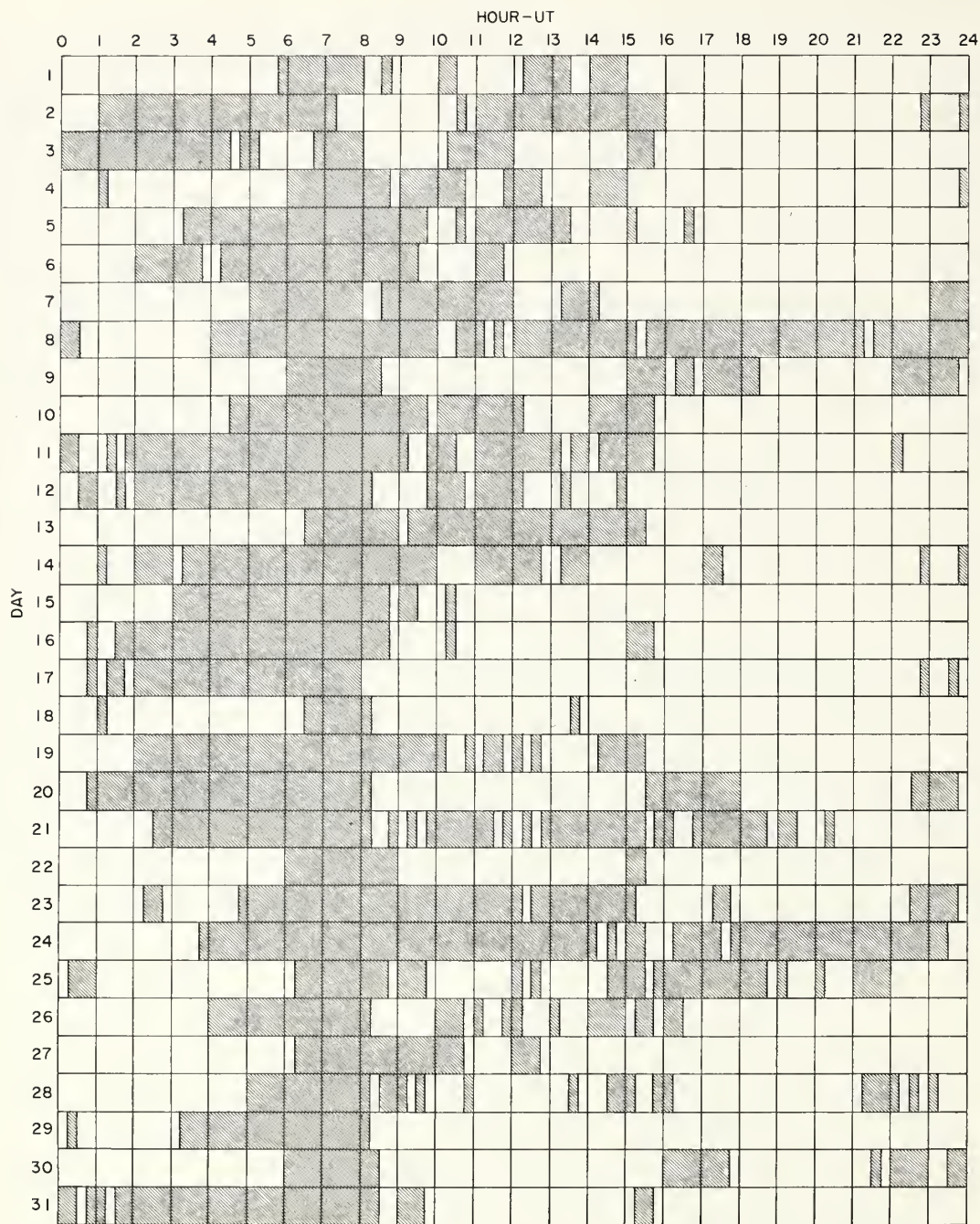
The flare areas reported by Hawaii from July 1957 to December 1959 were derived from original measurements based on millions of the solar disk instead of the hemisphere. In applying the conversion factor to square degrees this discrepancy was not recognized and hence for these months the areas reported in square degrees, both measured and corrected, are too large by a factor of two. The data for December 1959 for Hawaii in this issue have been converted properly to square degrees. Hawaii bases its flare "Importances" on the measured areas as do the High Altitude Observatory, Sacramento Peak Observatory and Lockheed.

LOCKHEED OBSERVATIONS: ALL VALUES IN THE MAXIMUM INTENSITY COLUMN ARE ARBITRARY UNITS ON A SCALE OF 10 TO 40 - NOT PERCENT OF THE CONTINUOUS SPECTRUM.

COMMERCE - STANDARDS - BULLDOG

INTERVALS OF NO FLARE PATROL OBSERVATIONS

DECEMBER 1959



Stations Include:

COMMERCE - STANDARDS - BOULDER - BOSTON - S.

Anacapri (Swedish)	Meudon
Arcetri	Mitaka
Arosa	Ondrejov
Dunsink	Royal Greenwich Observatory
Hawaii	Herstmonceux
Huancayo	Sacramento Peak
Locarno	Zurich
Lockheed	

Noted as follows: Date-Universal Time - Coordinates

NOVEMBER 1959

LOCKHEED 01 0825 E N16 W29
 LOCKHEED 01 2032 O 502 W75
 SAC PEAK 01 2042 N23 W11
 LOCKHEED 01 2042 N24 W12
 LOCKHEED 01 2103 N16 W37
 SAC PEAK 01 2116 503 W75

 * ARCTERI 02 0829 E N25 E47
 LOCKHEED 02 1033 N25 E45
 * LOCKARNO 02 1035 N21 W18
 MCMAH 02 1334 E N21 W19
 MCMAH 02 1549 E N22 E44

 LOCKARNO 03 0804 N26 E35
 WENDEL 03 0824 E N13 W59
 ARCTERI 03 0826 E N14 W63
 LOCKARNO 03 0830 N14 W66
 ARCTERI 03 0858 E N14 W63
 WENDEL 03 0931 E N14 W60
 WENDEL 03 1045 E N15 W61
 WENDEL 03 1152 E N15 W61
 ONOREJOV 03 1322 N22 W28
 WENDEL 03 1322 E N19 W24
 ONOREJOV 03 1347 E N13 W57
 WENDEL 03 1500 N13 W61
 * LOCKARNO 03 1506 N29 E67
 LOCKHEED 03 1821 E N15 W76
 LOCKHEED 03 1837 N15 W65
 LOCKHEED 03 1902 502 W90
 LOCKHEED 03 1902 N15 W76
 LOCKHEED 03 1906 N15 W76
 LOCKHEED 03 1918 N21 W30

 LOCKARNO 04 0909 N19 E19
 WENDEL 04 0925 E N22 E18
 WENDEL 04 1032 E N13 W81
 WENDEL 04 1036 E N31 W66
 WENDEL 04 1302 E N13 W65
 LOCKHEED 04 1727 N26 E17
 LOCKHEED 04 1835 N26 E17
 LOCKHEED 04 1836 N07 W88
 LOCKHEED 04 1929 E N07 W88
 * SAC PEAK 04 2120 E N18 E90
 SAC PEAK 04 2156 N14 W82
 SAC PEAK 04 2210 N13 W86

 HAWAII 05 0140 N22 E18
 CAPRI S 05 1214 E N22 E06
 SAC PEAK 05 1450 N19 W90
 * LOCKHEED 05 1600 U S18 E85
 LOCKHEED 05 1611 N19 W65
 LOCKHEED 05 1613 N15 W90
 LOCKHEED 05 1625 N18 E85
 LOCKHEED 05 1644 N27 E04
 LOCKHEED 05 1644 N18 E85
 SAC PEAK 05 1654 N24 E05
 LOCKHEED 05 1714 N18 E85
 SAC PEAK 05 1732 N23 E02
 MCMAH 05 1734 E N22 E00
 LOCKHEED 05 1736 N14 W90
 SAC PEAK 05 1740 N13 W90
 LOCKHEED 05 1745 N18 E80
 LOCKHEED 05 1802 N09 E89
 HAWAII 05 1802 E N27 E16
 LOCKHEED 05 1804 N14 W90
 SAC PEAK 05 1808 N13 W90
 LOCKHEED 05 1825 N18 E80
 LOCKHEED 05 1829 N09 E89
 LOCKHEED 05 1836 N09 E89
 LOCKHEED 05 1843 N29 E04
 LOCKHEED 05 1922 N23 W61
 LOCKHEED 05 1923 N14 W90
 LOCKHEED 05 2113 U S18 E80
 SAC PEAK 05 2116 N20 W90
 LOCKHEED 05 2120 N18 W90
 LOCKHEED 05 2211 N18 W90
 SAC PEAK 05 2212 N21 W90
 LOCKHEED 05 2224 N18 E77
 LOCKHEED 05 2252 N26 W01
 LOCKHEED 05 2256 N26 W01
 LOCKHEED 05 2317 S07 W05
 HAWAII 05 2320 E S16 W17
 LOCKHEED 05 2330 N23 E00
 HAWAII 05 2336 N23 E00

 * ARCTERI 06 0817 E S16 E68
 ARCTERI 06 0911 E N25 W02
 * SAC PEAK 06 1516 S19 E60
 SAC PEAK 06 1544 S18 E90
 LOCKHEED 06 1601 N21 W63
 * SAC PEAK 06 1612 N25 W10
 LOCKHEED 06 1634 N03 W27
 LOCKHEED 06 1635 S20 E61
 LOCKHEED 06 1652 S19 E60
 LOCKHEED 06 1747 N25 W10
 LOCKHEED 06 1816 S15 E90
 LOCKHEED 06 1844 S20 E61
 LOCKHEED 06 1846 S20 E61
 LOCKHEED 06 1937 S20 E61
 LOCKHEED 06 2018 N02 W37
 LOCKHEED 06 2024 S20 E61
 LOCKHEED 06 2116 N17 W81
 SAC PEAK 06 2118 N20 W80
 LOCKHEED 06 2126 S20 E61
 LOCKHEED 06 2150 N21 W75
 LOCKHEED 06 2152 S17 E60
 LOCKHEED 06 2225 S17 E59
 LOCKHEED 06 2311 S21 E58

 ARCTERI 07 0829 E N02 E40
 MCMAH 07 1321 E N24 W21
 MCMAH 07 1411 E S18 E52
 MCMAH 07 1536 E S18 E50
 LOCKHEED 07 1614 E N26 W21
 SAC PEAK 07 1640 S18 W49
 SAC PEAK 07 1708 S18 E49
 MCMAH 07 1751 E S18 E50
 LOCKHEED 07 1832 N16 W06
 LOCKHEED 07 1849 S17 E50
 LOCKHEED 07 2035 N10 W52
 SAC PEAK 07 2042 E N11 W52
 LOCKHEED 07 2056 S17 E50
 LOCKHEED 07 2059 N26 W23
 LOCKHEED 07 2120 S17 E50
 LOCKHEED 07 2209 N18 E85
 LOCKHEED 07 2249 N20 E81
 LOCKHEED 07 2305 N25 W26

 NIZAMIAH 08 0940 S17 E35
 NIZAMIAH 08 1012 S15 E38
 SAC PEAK 08 1616 S17 E33
 LOCKHEED 08 1630 U N20 W85
 LOCKHEED 08 1658 S18 E36
 LOCKHEED 08 1656 N18 W85
 LOCKHEED 08 1718 S10 E45
 LOCKHEED 08 1723 S18 E33
 SAC PEAK 08 1726 S17 E35
 LOCKHEED 08 1726 S17 E33
 LOCKHEED 08 1748 N18 W85
 LOCKHEED 08 1758 N06 E42

MCMAH 15 1511 E S15 W30
 MCMAH 15 1648 S06 E25
 HAWAII 15 1852 S08 E59
 HAWAII 15 1940 S08 W59
 HAWAII 15 1952 N04 E14

 CAPRI S 16 0928 E N05 E06
 LOCKARNO 16 1423 S16 W65
 LOCKHEED 16 1632 S19 W69
 LOCKHEED 16 1653 S15 W75
 SAC PEAK 16 1654 S18 W77
 SAC PEAK 16 1722 S18 W85
 LOCKHEED 16 1722 S18 W89
 SAC PEAK 16 1750 S17 W70
 LOCKHEED 16 1754 E S18 W69
 LOCKHEED 16 1813 S19 W69
 SAC PEAK 16 2002 N03 W65
 LOCKHEED 16 2003 N03 W64
 LOCKHEED 16 2048 S20 W85
 LOCKHEED 16 2147 N04 W01
 LOCKHEED 16 2148 S18 W72
 LOCKHEED 16 2357 S18 W78

 WENDEL 17 0826 E S17 W54
 WENDEL 17 0827 E S18 W50
 * CAPRI S 17 0912 E N05 W07
 SAC PEAK 17 1518 N04 W11
 SAC PEAK 17 1614 N18 E90
 LOCKHEED 17 1614 N18 E90
 LOCKHEED 17 1637 E S18 W90
 LOCKHEED 17 1650 N18 E90
 SAC PEAK 17 1652 N18 E90
 SAC PEAK 17 1709 N18 E90
 SAC PEAK 17 1714 N18 E90
 LOCKHEED 17 1741 N18 E90
 SAC PEAK 17 1810 N18 E90
 LOCKHEED 17 1855 N03 W13
 LOCKHEED 17 1920 N18 E90
 LOCKHEED 17 1920 N18 E90
 LOCKHEED 17 2150 N08 W16
 HAWAII 17 2304 N07 W15

 SAC PEAK 18 1456 N13 E90
 SAC PEAK 18 1614 N20 W60
 SAC PEAK 18 1716 N10 E50
 LOCKHEED 18 1922 N16 E90
 SAC PEAK 18 1929 N23 E90
 SAC PEAK 18 1940 S04 E60
 LOCKHEED 18 1944 E S03 E61
 LOCKHEED 18 2001 N18 E90
 LOCKHEED 18 2025 S05 W60
 LOCKHEED 18 2032 N15 E90
 LOCKHEED 18 2051 U N21 W68
 LOCKHEED 18 2109 N15 E90
 LOCKHEED 18 2110 N33 E08
 LOCKHEED 18 2141 S17 W75
 LOCKHEED 18 2229 N15 E90
 LOCKHEED 18 2255 N12 E09
 LOCKHEED 18 2258 N08 W90
 LOCKHEED 18 2301 N16 E90
 LOCKHEED 18 2305 N18 W66

 LOCKHEED 19 0012 N16 E90
 LOCKARNO 19 1005 E N16 E79
 WENDEL 19 1034 E N09 E61
 LOCKHEED 19 1740 N15 E79
 LOCKHEED 19 1759 N16 E80
 LOCKHEED 19 1840 S08 W90
 LOCKHEED 19 2000 N16 E80
 LOCKHEED 19 2027 N32 W06
 LOCKHEED 19 2133 N13 E80

 WENDEL 20 1100 E N06 E44
 WENDEL 20 1132 E N06 E43
 WENDEL 20 1205 E N06 E43
 LOCKHEED 20 1540 E N06 E61
 LOCKHEED 20 1705 N14 E75
 LOCKHEED 20 1822 N15 E76
 LOCKHEED 20 1844 N14 E71
 LOCKHEED 20 1858 N14 E78
 LOCKHEED 20 2018 N06 E39
 LOCKHEED 20 2220 N19 W17

 HAWAII 21 0012 N13 E68
 LOCKHEED 21 0013 N22 E65
 LOCKARNO 21 1250 N13 E63
 WENDEL 21 1358 E N13 E62
 WENDEL 21 1424 E N14 E61
 LOCKARNO 21 1428 N13 E62
 SAC PEAK 21 1716 N15 E55
 * LOCKHEED 21 1840 E N18 E62
 LOCKHEED 21 1937 N24 E58
 LOCKHEED 21 1943 N17 E40
 LOCKHEED 21 2001 N16 E70
 HAWAII 21 2001 N07 E48
 LOCKHEED 21 2018 N15 E50
 HAWAII 21 2054 N17 E63
 LOCKHEED 21 2055 N27 E97
 LOCKHEED 21 2155 N16 E57
 LOCKHEED 21 2205 N26 E58
 HAWAII 21 2318 N11 E45

 * WENDEL 22 1225 E N21 E40
 WENDEL 22 1244 E N05 E16
 SAC PEAK 22 1534 N07 E17
 SAC PEAK 22 1546 N05 E14
 LOCKHEED 22 2215 N03 E10
 LOCKHEED 22 2318 N10 W24
 LOCKHEED 22 2318 N03 E11

 WENDEL 23 0915 E S20 E27
 WENDEL 23 1003 E S17 E25
 WENDEL 23 1003 E S17 E25
 WENDEL 23 1147 E S19 E23
 * WENDEL 23 1418 E N24 E31
 LOCKHEED 23 1552 S20 E21
 LOCKHEED 23 1610 N26 E79
 LOCKHEED 23 1645 N25 E34
 LOCKHEED 23 1715 N26 E79
 LOCKHEED 23 2001 E N21 E4
 LOCKHEED 23 1825 N23 E87
 LOCKHEED 23 1905 U N15 W64
 LOCKHEED 23 1955 S20 E74
 LOCKHEED 23 2047 S20 E74
 LOCKHEED 23 2242 N22 E74
 LOCKHEED 23 2308 N25 E29
 LOCKHEED 23 2334 N06 W05

 NIZAMIAH 24 0307 N08 E23
 WENDEL 24 0933 E N28 E22
 WENDEL 24 1245 E N22 E24
 LOCKHEED 24 1720 S18 E07
 LOCKHEED 24 1730 S23 E12
 LOCKHEED 24 1759 S25 E21
 LOCKHEED 24 1912 N25 E20
 LOCKHEED 24 1915 N10 E90
 LOCKHEED 24 2003 N21 E90
 LOCKHEED 24 2101 N23 E15
 LOCKHEED 24 2115 N10 E90
 LOCKHEED 24 2133 N10 E90

SUBFLARES

Noted as follows: Date-Universal Time - Coordinates
NOVEMBER 1959

LOCKHEED	24	2154	S19 E03	LOCKHEED	27	1609	N12 E43	LOCKHEED	29	1640	N09 E90
LOCKHEED	24	2201	N10 E90	SAC PEAK	27	1612	N12 E62	LOCKHEED	29	1719	N10 E22
LOCKHEED	24	2244	N22 E09	LOCKHEED	27	1615	N12 E62	LOCKHEED	29	1752	N11 E17
LOCKHEED	24	2244	N10 E90	LOCKHEED	27	1645	S14 W40	SAC PEAK	29	1802	N23 W07
LOCKHEED	24	2253	N11 W08	LOCKHEED	27	1738	N10 E52	LOCKHEED	29	1806	N21 W06
LOCKHEED	24	2334	N11 W08	LOCKHEED	27	1749	N14 E57	LOCKHEED	29	1837	N19 W49
LOCKHEED	25	1128	S18 W15	SAC PEAK	27	1750	N05 E58	LOCKHEED	29	1850	N24 W03
WENDEL	25	1152 E	S18 W01	LOCKHEED	27	1915	N11 E59	SAC PEAK	29	1851	N27 W01
WENDEL	25	1220 E	S17 W02	SAC PEAK	27	1934	N12 E59	SAC PEAK	29	1928	S17 W65
WENDEL	25	1234 E	S18 W02	LOCKHEED	27	1935	N13 E58	LOCKHEED	29	1929	S11 W65
WENDEL	25	1333 E	S18 W03	HAWAII	27	1940 E	N04 E60	* LOCKHEED	29	2005	N08 E18
WENDEL	25	1342 E	N25 E07	LOCKHEED	27	2016	S10 E42	HAWAII	29	2026	N08 E19
MCNATH	25	1343 E	S17 W07	SAC PEAK	27	2046	S14 W44	LOCKHEED	29	2034	N11 E30
WENDEL	25	1344 E	N26 E57	HAWAII	27	2046	S09 W46	LOCKHEED	29	2042	N11 E23
WENDEL	25	1351 E	S18 W03	* SAC PEAK	27	2106	N17 W22	LOCKHEED	29	2047	N11 E23
SAC PEAK	25	1504	S17 W09	* LOCKHEED	27	2106	N15 W23	LOCKHEED	29	2053	N19 E21
SAC PEAK	25	1522	S17 W19	LOCKHEED	27	2115	N11 E53	LOCKHEED	29	2103	N11 E17
SAC PEAK	25	1750	N21 E58	SAC PEAK	27	2200	N06 E56	HAWAII	29	2106	N08 E19
LOCKHEED	25	1751	N20 E55	LOCKHEED	27	2203 E	N06 E54	LOCKHEED	29	2110	N13 E24
LOCKHEED	25	1856	N21 E03	LOCKHEED	27	2203	N28 W20	LOCKHEED	29	2136	N10 E25
LOCKHEED	25	1905	N16 E03	LOCKHEED	27	2209	S15 W42	HAWAII	29	2138	N04 E28
SAC PEAK	25	1908	N14 E05	LOCKHEED	27	2309	N13 E48	HAWAII	29	2158	N08 E19
LOCKHEED	25	1949	N05 E83	LOCKHEED	28	0007	S11 W45	LOCKHEED	29	2209	N11 E25
SAC PEAK	25	1952	N04 E80	* CAPRI S	28	0054 E	S16 W49	LOCKHEED	29	2232	N11 E18
LOCKHEED	25	2004	S17 W15	WENDEL	28	1058 E	S18 W49	LOCKHEED	29	2302	N08 E13
SAC PEAK	25	2004	S17 W15	* WENDEL	28	1114 E	N12 E36	LOCKHEED	29	2317	N09 E13
LOCKHEED	25	2007	N18 E08	WENDEL	28	1202 E	N12 E36	* LOCKHEED	29	2323	N10 E15
LOCKHEED	25	2015	N18 E01	SAC PEAK	28	1506	N05 E47	LOCKHEED	29	2344	N07 E15
LOCKHEED	25	2018	S17 W11	SAC PEAK	28	1602	N13 E35	LOCKHEED	29	2353	N13 E22
LOCKHEED	25	2039	S17 W12	SAC PEAK	28	1632	N23 E08	LOCKHEED	29	2354	N12 E20
LOCKHEED	25	2044	S15 W11	LOCKHEED	28	1712	N22 E08	LOCKHEED	29	2354	N16 E20
LOCKHEED	25	2047	S18 W11	SAC PEAK	28	1712	N23 E08	HAWAII	30	0048	N17 E17
LOCKHEED	25	2057	N14 E70	LOCKHEED	28	1719	N12 E34	HAWAII	30	0128 E	N17 E17
SAC PEAK	25	2058	N11 E70	LOCKHEED	28	1755	N11 E36	* HAWAII	30	0154 E	N09 E15
LOCKHEED	25	2313	N06 E80	LOCKHEED	28	1845	N12 E33	WENDEL	30	0918 E	N03 W59
LOCKHEED	25	2315	S20 W12	LOCKHEED	28	1902	N05 E45	SAC PEAK	30	1446 E	N16 W12
NIZAMIAH	26	0345	N10 E72	LOCKHEED	28	1935	N05 E45	SAC PEAK	30	1450	N12 E12
WENDEL	26	0758 E	S15 W18	LOCKHEED	28	2046	N24 E05	SAC PEAK	30	1458	N09 E07
WENDEL	26	1021 E	N24 W01	SAC PEAK	28	2054	N24 E04	SAC PEAK	30	1530	N11 E15
WENDEL	26	1030 E	N23 E39	LOCKHEED	28	2104	N27 E16	LOCKHEED	30	1535 E	N13 E14
WENDEL	26	1210 E	N10 E62	HAWAII	28	2110 E	N23 E07	LOCKHEED	30	1552	N08 E07
WENDEL	26	1221 E	N22 E49	LOCKHEED	28	2118	N22 E59	LOCKHEED	30	1603	S04 E26
WENDEL	26	1221 E	N10 E69	SAC PEAK	28	2156	N15 E30	SAC PEAK	30	1618	N10 E05
SAC PEAK	26	1512	N12 E60	LOCKHEED	28	2157	N21 E05	LOCKHEED	30	1635	N16 W63
LOCKHEED	26	1613	N11 E69	LOCKHEED	28	2158	N14 E31	LOCKHEED	30	1703	N09 E07
LOCKHEED	26	1614	S17 W20	LOCKHEED	28	2234	N12 E31	LOCKHEED	30	1825	N22 W67
LOCKHEED	26	1631	S14 W25	LOCKHEED	28	2310	N10 E29	LOCKHEED	30	1918	N08 E05
LOCKHEED	26	1631	N10 E69	LOCKHEED	28	2325	N10 E30	LOCKHEED	30	1933	N09 E04
LOCKHEED	26	1647	N08 W07	* LOCKHEED	28	2346	N12 E30	SAC PEAK	30	1936	N10 E10
SAC PEAK	26	1650	N10 E08	HAWAII	29	0016 E	N21 E05	LOCKHEED	30	1936	N11 E11
SAC PEAK	26	1652	N19 W07	WENDEL	29	1020 E	N09 E24	LOCKHEED	30	2005	N12 E15
LOCKHEED	26	1653	N24 E35	WENDEL	29	1030 E	S17 W59	LOCKHEED	30	2010	N09 E05
LOCKHEED	26	1721	N15 E61	* SAC PEAK	29	1450 E	N09 E19	LOCKHEED	30	2036	N14 E10
SAC PEAK	26	1728	N15 E60	MCNATH	29	1454	S13 E08	LOCKHEED	30	2041	N09 E05
HAWAII	26	1914 E	N09 W08	SAC PEAK	29	1454	S13 E06	SAC PEAK	30	2056	N12 E16
SAC PEAK	26	1918	N08 W09	SAC PEAK	29	1534	N25 W13	HAWAII	30	2058	N10 E18
SAC PEAK	26	2048	N24 E33	SAC PEAK	29	1616	N21 E47	LOCKHEED	30	2110	N06 E15
CAPRI S	27	0820 E	N13 E62	MCNATH	29	1616	N21 E46	SAC PEAK	30	2132	N05 E15
CAPRI S	27	0928	N13 E62	LOCKHEED	29	1617	N20 E47	SAC PEAK	30	2144	N07 E05
CAPRI S	27	1334 E	N20 W16	LOCKHEED	29	1628	N21 W47	LOCKHEED	30	2144	N10 E03
SAC PEAK	27	1608	N12 E46	LOCKHEED	29	1640	N09 E21	LOCKHEED	30	2226	N15 E07
								LOCKHEED	30	2229	N10 E03

* Rated as flare of importance ≥ 1 by other observatories (See CRPL-F 184 Part B).

Errata to subflares for September 1959 published in CRPL-F 183 Part B:

Lockheed 03 1720 should be Lockheed 04 1720.
Lockheed 02 2102 should be Lockheed 04 2102.
McMath 26 1545E should be McMath 27 1545E.

COMMENCE - STANDPUSH - BULKIER

SOLAR FLARES

JANUARY - AUGUST 1959

OBSERVATORY	DATE	OBSERVED UNIVERSAL TIME		LOCATION			DURA- TION — MINUTES	IM- POR- TANCE	OBS. COND.	MEASUREMENTS				PROVISIONAL IONOSPHERIC EFFECT		
		START	END	MAX. PHASE	APPROX. LAT.	APPROX. LONG. PLAGE REGION				TIME — U T	MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg.	MAX. WIDTH Ha		MAX. INT. %	
KYOTO	1959 JAN															
	06	0142	0145	N12	W65	4936	3	16		0142	6.23		1.32	100		
	11	0120	0135 D	N18	W42	4951	15 D	1		0120	5.82		1.32	100		
	12	0024 E	0032 D	N12	W16	4953	8 D	1		0026	2.49		1.83	110		
	19 FEB	0035	0105 D	N20	E33	4974	30 D	2		0037	7.06		2.25	120	Slow S-SWF	
	05	0557	0601 D	N20	W08	4992	4 D	16		0557	7.27		1.32	70		
	11 MAR	0631	0723 D	N06	E64	5009	52 D	16		0631	4.15		2.00	130		
	04	0020 E	0032 D	S11	E44	5039	12 D	1		0023	3.32		2.68	110		
	04	0220	0225 D	N23	W78	5026	5 D	1		0220				110		
	04	0551 E	0609 D	S18	E16	5036	18 D	1		0553	2.91		2.83	120		
	20	0437	0522	N14	E60	5060	45	16		0441	4.36		2.34	120		
	27 KYOTO	0145 E	0215 D	N24	E55	5071	30 D	2		0155	7.27		1.66	140	Slow S-SWF	
	27 KYOTO	0703 E	0720 D	N08	E39	5066	17 D	1		0703	2.08		1.66	100		
	28 KYOTO	0038 E	0101 D	S09	W08	5063	23 D	1		0038	4.36		1.16	100		
28 KYOTO	0105	0110 D	N13	E53	5071	5 D	1		0105	2.08		1.13	130			
28 KYOTO	0119 E	0215 D	N23	E42	5071	56 D	2		0120	9.14		1.68	120			
28 KYOTO	0148 E	0152 D	N12	E52	5071	4 D	1		0148	2.08		1.68	120			
28 KYOTO	0553 E	0724 D	N12	E52	5071	91 D	1		0634	1.45		1.50	120			
KYOTO	01 APRIL	0507	0515 D	N25	W16	5071	8 D	2		0507			1.68	140	Slow S-SWF	
	06 KYOTO	0422	0428 D	N13	E07	5080	6 D	1		0422	2.91		1.66	120		
	06 KYOTO	0454	0501 D	N17	W66	5071	7 D	1		0454	2.28		1.32	100		
	06 KYOTO	0654 E	0701 D	N21	E64	5085	7 D	1		0654	2.49		2.00	120		
	06 KYOTO	0750 E	0805	N12	E66	5083	15 D	1		0750				110		
	24 KYOTO	0518 E	0555 D	N11	E90	5122	37 D	1		0518			3.19	130		
	25 KYOTO	0425	0445 D	N33	E66	5119	20 D	1		0425				100		
	02 KYOTO	0245	0250 D	S08	W05	5124	5 D	1		0245	4.15		1.49	100		
	03 KYOTO	0021	0042 D	N14	W48	5120	21 D	16		0021	5.19		1.83	120	Slow S-SWF	
	03 KYOTO	0106 E	0114 D	N14	W48	5120	8 D	16		0106	4.57		3.02	130		
	04 KYOTO	0150 E	0206 D	N16	W60	5120	16 D	1		0201			2.17	110		
	04 KYOTO	0357	0413 D	N15	W55	5120	16 D	16		0357	5.40		2.17	120	S-SWF	
	04 KYOTO	0400 E	0423 D	S08	W20	5137	23 D	2		0402	7.27		5.82	130	S-SWF	
	04 KYOTO	0508	0524 D	N15	W60	5120	16 D	16		0508	8.31		2.17	80	S-SWF	
KYOTO	13 KYOTO	0501	0510 D	N20	E24	5148	9 D	1		0501	1.45		3.36	130		
	13 KYOTO	0510 E	0551 D	N21	E29	5148	41 D	2		0516	5.82		5.47	200	S-SWF	
	13 KYOTO	0701	0710 D	N08	E24	5148	9 D	1		0701	1.25		2.34	100		
	13 KYOTO	0701	0734 D	N10	E21	5148	33 D	16		0701	4.15		3.02	120		
	14 KYOTO	0505 E	0523	S13	W61	5133	18 D	1		0512	2.28		1.33	100		

SOLAR FLARES

JANUARY - AUGUST 1959

OBSERVATORY	DATE	OBSERVED UNIVERSAL TIME		LOCATION			DURA- TION — MINUTES	IM- POR- TANCE	OBS. COND.	MEASUREMENTS				PROVISIONAL IONOSPHERIC EFFECT		
		START	END	MAX. PHASE	APPROX.					MCARTH PLACE REGION	TIME — U T	MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg.		MAX. WIDTH H _o	MAX. INT. %
					LAT.	MER. DIST.										
KYOTO	1959															
	14	0530 E	0558 D	N13 E08		5148	28 D	16		0532	4.36			120		
	14	0530 E	0603 D	N09 E10		5148	33 D	1		0532	3.12		1.83	120		
	14	0536 E	0610 D	N17 E11		5148	34 D	2		0550	5.19			120		
KYOTO	14	0620	0756 D	S13 W63		5133	96 D	2		0620	5.82		2.34	90		
KYOTO	19	2332 E	0024	N23 E41		5158	52 D	1		2332	1.66		1.66	100		
KYOTO	20	0004 E	0020 D	N21 E40		5158	16 D	1		0004	1.66		1.16	100		
KYOTO	20	0017 E	0024 D	N21 W62		5148	7 D	1		0017	2.08			80		
KYOTO	20	0112 E	0128 D	N22 E11		5157	16 D	1		0112	2.91		1.66	120		
KYOTO	20	0638	0705 D	N21 E40		5158	27 D	1		0645	2.28		2.00	100		
KYOTO	20	0638	0714 D	N23 E41		5158	36 D	1		0645	2.49		1.66	100		
KYOTO	25	0444	0455 D	N01 E19		5166	11 D	1		0444	1.66		1.56	100		
KYOTO	28	0121	0123 D	W10			2 D	2		0121	2.91		1.66	100		
KYOTO	28	0415 E	0440 D	N01 W28		5166	25 D	1		0425	1.66			80		
KYOTO	28	0725 E	0805 D	S16 W13		5167	40 D	16		0740	3.32		2.02	120	G-SWF	
KYOTO	28	2237 E	2344 D	S13 W69		5176	67 D	1		2239	2.08		2.17	100		
KYOTO	28	2246 E	2312 D	N01 W45		5166	26 D	1		2246	1.45		1.66	100		
KYOTO	29	0248 E	0259 D	S16 W35		5167	11 D	16		2251	4.36		3.70	120		
KYOTO	JUNE															
KYOTO	01	0046 E	0115	S12 E44		5179	29 D	1		0046	4.78		1.66	120	G-SWF	
KYOTO	01	0235	0250	S13 E43		5179	15	1		0235				100		
KYOTO	02	2252 E	2259	N09 W45		5173	7 D	1		2252	2.08		1.49	100		
KYOTO	02	2318 E	2327	N09 W45		5173	9 D	1		2318	1.25		2.85	120		
KYOTO	07	0440 E	0452	S08 W38		5179	12 D	16		0442	4.99		2.68	120		
KYOTO	08	0749	0805	S08 W53		5179	16	2		0753	4.15		3.02	150		
KYOTO	09	0046 E	0050	N12 W24		5185	4 D	1		0046	3.12			80		
KYOTO	09	0644	0742	S25 E12		5194	58	16		0707	5.82		1.83	90		
KYOTO	12	0829 E	0900 D	N21 E63		5204	31 D	16		0839	6.02		3.19	120	G-SWF	
KYOTO	12	2345 E	2350 D	N16 E57		5204	5 D	1		2345				100		
KYOTO	13	0118	0130 D	N20 E53		5204	12 D	1		0118	4.36		2.00	100		
KYOTO	14	0637 E	0716	N17 E42		5204	39 D	2		0637	5.61		2.68	150	S-SWF	
KYOTO	15	0544	0625 D	N19 E28		5204	41 D	2		0553	8.31		2.00	120		
KYOTO	16	0715 E	0740	N14 E21		5204	25 D	2		0715	22.85		1.66	100		
KYOTO	17	2310	2343	N11 E65		5219	33	16		2310	11.63		1.00	100		
KYOTO	19	0032 E	0055	N15 W18		5204	23 D	16		0032	5.82		1.32	120		
KYOTO	26	0423 E	0444	N09 W06		5225	21 D	26		0423	12.46		2.34	150		
KYOTO	26	2300	2318	N19 E07		5227	18	1		2300	3.74		2.34	90		

SOLAR FLARES

JANUARY - AUGUST 1959

OBSERVATORY	DATE	OBSERVED UNIVERSAL TIME		LOCATION			DURA- TION — MINUTES	IM- POR- TANCE	OBS. COND.	MEASUREMENTS				PROVISIONAL IONOSPHERIC EFFECT																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
		START	END	MAX. PHASE	APPROX. LAT.	MER. DIST.				MCNATH PLAGE REGION	TIME — U T	MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg.		MAX. WIDTH Ha	MAX. INT. %																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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SOLAR FLARES

JANUARY - AUGUST 1959

OBSERVATORY	DATE	OBSERVED UNIVERSAL TIME		LOCATION			DURA- TION — MINUTES	IM- POR- TANCE	OBS. COND.	MEASUREMENTS					PROVISIONAL IONOSPHERIC EFFECT
		START	END	APPROX. LAT.	MER. DIST.	MATH- PLAGE REGION				TIME — UT	MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg.	MAX. WIDTH Ha	MAX. INT. %	
KYOTO	27	2332	0027 D	N25	E09	5339	55 D	2		2337	12.46		2.00	130	
KYOTO	28	0055	0125	S11	E23	5340	30	16		0055				120	Slow S-SWF
KYOTO	28	0135	0203	S10	E27	5342	28	16		0145	6.44			100	S-SWF
KYOTO	28	0550	0610	N14	E18	5341	20	2		0550	5.82			120	
KYOTO	29	0205	0221	N09	E50	5347	16	16		0208			1.66	120	S-SWF
KYOTO	29	0430	0452	S11	W01	5340	22	2		0435	9.14		1.59	120	
KYOTO	29	0458	0610	S10	W01	5340	72	1		0520	5.19		1.00	100	
KYOTO	29	0659	0707	S11	E02	5340	8	1		0659			1.32	100	

COMMENCE - STANDARDS - BOULDER

E - LESS THAN

D - GREATER THAN

U - APPROXIMATE

□ - NOT REPORTED

REVISED HOURS OF NO FLARE PATROL OBSERVATIONS
for
JANUARY THROUGH AUGUST 1959

IIIk

Month	Day	Hours of no observations	Month	Day	Hours of no observations
January	12	0700-0800	May	4	0245-0300
January	20	1445-1515	May	20	1700-1800
February	4	2315-2330	June	1	0445-0500
February	5	None			0545-0600
February	12	2130-2315	June	2	0315-0330
March	11	0300-0400	June	3	2245-2300
		0430-0500	June	9	0615-0645
		0545-0600	July	5	None
March	28	None	July	17	None
April	6	1730-1800	August	3	None
May	1	0545-0600	August	11	None
		1530-1600	August	17	0400-0430
		1715-1745			
May	2	0600-0645			
		1200-1245			

COMMERCE - STANDARDS - BOULDER

SOLAR FLARES

SEPTEMBER 1959

OBSERVATORY	DATE SEPT 1959	OBSERVED UNIVERSAL TIME		LOCATION			DURA- TION — MINUTES	IM- POR- TANCE	OBS. COND.	MEASUREMENTS			PROVISIONAL IONOSPHERIC EFFECT	
		START	END	APPROX. LAT.	MER. DIST.	MC-MATH PLACE REGION				TIME — UT	MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg.		MAX. WIDTH H _g
{ SYDNEY VOROSHILOV SYDNEY SYDNEY SYDNEY SYDNEY TASHKENT TASHKENT GOOD HOPE PIRCULI	01	0046	0053 D	S10	E57	5353	7 D	1	1	0049	2.00	4.00	73	
	01	0048 E	0058	S12	E60	5353	10 D	1	1	0050	5.59			
	01	0204	0235	S10	W45	5340	31	1	0215	4.00	6.00			
	01	0217	0221 D	S11	E55	5353	4 D	1	1	0219	2.00	5.00	55	
	01	0440	0510 D	N14	E19	5348	30 D	1	1	0450	3.00	3.00		
	01	0533	0549	N09	W07	5344	16	1	0537	1.10				
	01	0748	0940	N13	E13	5344	112	1	1	0807	4.10	4.20	51	
	01	0750	0840	N14	E13	5344	80	1	2	0830	8.26			
	01	0823	0845	N12	E90	5356	22	1	1	0829	4.0			
	01	0915	0931	N17	W90	5336	16	1	1	0917	1.80		S-SWF	
01	1106	1120	S11	E55	5353	14	1	1	1107	1.40	2.70			
01	1359	1437 D	S12	W53	5340	38 D	2	1	1410	3.20	5.90	S-SWF		
01	1419	1437 D	N09	W12	5344	18 D	1	1	1423	2.70	2.70			
01	1623	1437 D	S13	W71	5339	14 D	2	2	1433	3.50			S-SWF	
01	1657 E	1752	S13	W49	5340	55 D	2	2	1709	7.00	3.60			
01	2327	2359	N25	W66	5339	32	1	2	2337	1.00	2.00	S-SWF		
SYDNEY	02	0018	0053	N10	W16	5344	35	1	3	0028	2.00		2.00	S-SWF
	02	0113	0130	N10	W14	5344	17	1	1	0113				
	02	0135	0214	N13	W01	5344	39	1	2	0148	2.00	2.00	120	
	02	0147	0158 D	N12	W05	5344	11 D	1	1	0150	3.74	1.00		
	02	0148	0220	N32	W68	5339	32	1	2	0208	1.50	4.00		130
	02	0310 E	0512	S12	W63	5340	122 D	2	1	0428	5.92			
	02	0310 E	0612 D	N17	E21	5348	182 D	1	1	0434	11.84	2.00	140	
	02	0403	0504 D	S02	E35	5351	61 D	1	3	0413	1.50			
	02	0410	0508	N00	E37	5351	58	1	3	0415	4.96	18.00		65
	02	0529	0600	N09	W18	5344	31	1	3	0540	4.22			
02	0720	0954	N10	W10	5344	154	2	3	0751	7.30	7.40	Slow S-SWF		
02	0724	0900 D	N06	W09	5344	96	3	3	0751	12.70	12.70			
02	0724	0905 D	N11	W09	5344	101 D	3	2	0830	16.53			100	
02	0729 E	0830 D	N09	W09	5344	61 D	2	1	0736	12.67		175		
02	0857	0949	N13	W64	5340	52	1	1	0922	1.70	4.00			
02	1149	1228	N25	W75	5339	39	1	1	1200	1.70			Slow S-SWF	
02	1300	1318	S14	W66	5340	18	1	1	1304	1.10	2.90	S-SWF		
02	1603	1617	N24	W80	5339	14	26	2	1604	7.00	16.00			
02	1617 E	1637	N27	W74	5339	20 D	2	2	1619	3.50	10.40		110	
02	2353 E	0036 D	N08	W09	5344	43 D	1	1	2353	2.08				
{ ALMA-ATA ALMA-ATA SYDNEY TASHKENT GOOD HOPE GOOD HOPE GOOD HOPE GOOD HOPE UCCLE HUANCAYO KYOTO	03	0304 E	0607 D	N18	E09	5348	183 D	1	1	0425	7.89			130
	03	0421	0436	N25	W85	5339	15	2	0423	7.89		205		
	03	0421	0438	N27	W86	5339	17	2	0423	5.00				
	03	0421	0439	N23	W86	5339	18	26	0423	6.42			175	
	03	0646	0711	S13	W80	5340	25	1	0655	1.20		2.70		
	03	0859 E	0909	S04	W35	5343	10 D	1	3	0904	1.90			2.30
	03	0900	0916	S05	W36	5343	16	1	0901	2.20	2.30		2.60	
	03	0941	1046	N14	W13	5344	65	1	0951			100		
	03	0943 E	1010	N15	W15	5344	27 D	1	3	0947				
	03	1437	1445	N10	E66	5356	8	1	3					
04	1041 E	1054	N10	W50	5344	13 D	1	3	1043	1.40	2.70			
05	0145	0155	S10	W90	5340	10	1	0145			3.00			
05	0938	0942 D	N10	W59	5344	4 D	1	0941			1.66			

SOLAR FLARES

SEPTEMBER 1959

OBSERVATORY	DATE SEPT 1959	OBSERVED UNIVERSAL TIME		LOCATION			DURA- TION — MINUTES	IM- POR- TANCE	OBS. COND.	MEASUREMENTS				PROVISIONAL IONOSPHERIC EFFECT	
		START	END	APPROX. LAT.	M- MAG PLAGE REGION	TIME — U T				MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg.	MAX. WIDTH Ho	MAX. INT. %		
{ ONDREJOV SYDNEY VOROSHILOV	05	1557	1612	N13	W53	5344	15	16	3	1559	3.00	8.00	3.60	68	Slow S-SWF
	05	2338	0000	N05	E80	5360	22 D	2	3	2343	5.07				
	05	2339	2347	N06	E70	5360	8 D	16	1	2342					
SYDNEY ALMA-ATA GOOD HOPE	06	0420	0430	N16	W51	5344	10	1	3	0421	1.00	2.00		150	
	06	0543	0546 D	N20	W25	5348	3 D	1	1	0544	5.92				
	06	0909	0950	S20	E68	5361	41 D	1	1	0917	1.20	3.50			
SYDNEY	07	0104	0210 D	N17	E49	5359	66 D	1	3	0132	1.50	2.00			
SYDNEY SYDNEY { ONDREJOV	08	0029	0039	S15	E89	5365	10 D	□	1	0030	.75			100	
	08	0040	0106 D	S18	W71	5363	26 D	1	1	0044	1.50	3.00			
	08	0537	0555	S18	E44	5361	18 D	1	3	0546	2.33		4.80		
{ TASHKENT KHARKOV { ONDREJOV	08	0544	0550 D	S19	E44	5361	6 D	16	2	0546	9.14		2.10	2.60	
	08	0847	0905	N21	W62	5348	18 D	16	2	0848					
	08	0849	0858	N19	W63	5348	9 D	1	3	0853	5.61		1.50		
KHARKOV	08	0857	0915	N18	W42	5354	18 D	1	2	0859					
KYOTO KYOTO { ONDREJOV	09	0124	0127	N06	E38	5360	3 D	1		0124	2.49		1.49	100	Slow S-SWF
	09	0128	0152	N05	E33	5360	24	1	2	0128	1.45		1.48		
	09	0654	0754	N06	E31	5360	60 D	16		0658	4.70	5.20	2.20		
{ ATHENS HUANCAYO	09	0655	0758	N04	E28	5360	63	2	4		6.60	7.30	2.10	2.10	Slow S-SWF
	09	1556	1655	N05	E25	5360	59 D	16	2	1556					
KYOTO { GOOD HOPE KRASNAYA	10	0147	0158	N06	E21	5360	11	1		0147	2.49		1.16	130	
	10	0745	0806	N20	W90	5348	21	1		0751	1.00				
	10	0745	0858	N18	W90	5348	73	16	1	0749	2.70				
GOOD HOPE ONDREJOV UCCLE	10	1005	1020	N09	E13	5360	15	1		1008	2.80	2.90	2.30	100	
	10	1444	1457	N05	E12	5360	13 D	1	3	1445					
	10	1541		N15	E33	5362		□	5						
SYDNEY KRASNAYA VOROSHILOV	11	0316	0333	N21	W68	5355	17	1	3	0321	1.00	3.00		80	Slow S-SWF
	11	0851	0909	S17	W18	5367	18	1	2	0853	2.18				
	11	2157	2211	N14	E01	5362	14	1	2	2159	4.34				
VOROSHILOV TASHKENT TASHKENT	13	0018	0137	N06	W20	5360	79	16	2	0039	6.88			85	Slow S-SWF
	13	0300	0600 D	N17	E85	5373	180 D	1	2	0309	2.01		42.00		
	13	0531	0539	N04	E47	5366	20	1	2	0540	2.93		2.30		
ONDREJOV KRASNAYA UCCLE	13	0534	0624	N17	E80	5373	50 D	16	2	0605			3.00	90	
	13	0657	0741 D	N14	E90	5373	44 D	1	2	0703	1.87				
	13	0704	0722 D	S22	W24	5361	18 D	1	2	0706	4.57				
GOOD HOPE TASHKENT ATHENS	13	1010	1030 D	N09	E85	5373	20 D	16	3					65	S-SWF
	13	1415	1418 D	N14	E85	5373	3 D	1		1417	1.20				
	14	0548	0610 D	N05	W36	5360	22 D	1	2	0552	6.98	6.00	1.70		
UCCLE UCCLE UCCLE	14	0747	0825	N14	E75	5373	38	2	4		2.00				
	14	0933	0944	N30	W74	5374	11 D	1	4						
	14	0933	0955	N08	E73	5373	22 D	16	4						
ONDREJOV ONDREJOV VOROSHILOV	14	1000	1010	S13	W62	5367	10	1	2	1604			3.10	110	
	14	1603	1609	S18	W68	5367	6	1	3	1630			3.20		
	14	1628	1632	N15	E65	5373	4	1	2	2140	2.16				
VOROSHILOV	14	2135	2145	S16	W72	5367	10	16	2	2325	3.43			76	
VOROSHILOV	14	2315	2332	N16	E67	5373	17 D	1	2						

SOLAR FLARES

SEPTEMBER 1959

OBSERVATORY	DATE SEPT 1959	OBSERVED UNIVERSAL TIME		LOCATION		IM- POR- TANCE	OBS. COND.	MEASUREMENTS				PROVISIONAL IONOSPHERIC EFFECT
		START	END	APPROX. LAT.	APPROX. MER. DIST.	DURA- TION — MINUTES		TIME U T	MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg.	MAX. WIDTH H _g	
VOROSHILOV	15	0008	0033	N28 W90	5374	25	2	0024	1.45			110
VOROSHILOV	15	0016	0040	N14 E65	5373	24	2	0034	3.97			87
VOROSHILOV	15	0035	0112	N28 W90	5374	37	2	0042	1.45			93
VOROSHILOV	15	0124	0127	S19 W70	5367	3	2	0126	1.62			115
ALMA-ATA	15	0303 E	0602 D	S17 W73	5367	179 D	1	0558	9.87			140
ONDREJOV	15	0759	0804	S16 W75	5367	5	1	0802			2.60	
GOOD HOPE	15	0817 E	0902	S18 W74	5367	45 D	3	0817	2.30			
GOOD HOPE	15	1037	1055	N14 E56	5373	18	1	1043	1.80	3.20		
{ ONDREJOV	15	1045 E	1053	N14 E52	5373	8 D	3	1045			2.40	
GOOD HOPE	15	1227	1236	N14 E57	5373	9	1	1229	2.00	3.70		
GOOD HOPE	15	1314	1338 D	N14 E57	5373	24 D	1	1318	1.20	2.20		
{ ONDREJOV	15	1315	1332	N15 E50	5373	17	3	1318			3.20	
SYDNEY	16	0351	0415	N12 E48	5373	24	1	0358	1.50	2.00		
GOOD HOPE	16	0742	0759	N21 E90	5379	17	1	0746	.60			
HUANCAYO	16	1532	1625	N04 W68	5360	53	2	1558	2.40	6.40	3.90	
HUANCAYO	16	1613 E	1643	S20 W20	5365	30 D	2	1620	1.90	2.30		
ONDREJOV	17	1120	1133	S13 E11	5375	13	3	1120			2.50	
UCCLE	17	1149	1210	N19 E90	5379	21	3					
SYDNEY	18	0010	0017 D	N19 E71	5379	7 D	3	0014	1.00	4.00		
{ GOOD HOPE	18	0716	0732	N18 E75	5379	16	1	0720	.90			
ATHENS	18	0718	0734	N18 E75	5379	16	3		1.20	3.60		
ONDREJOV	18	1036 E	1051	N20 E70	5379	15 D	3	1038			2.40	
ONDREJOV	20	0553 E	0617	N28 E64	5379	24 D	3	0600			2.90	
ONDREJOV	20	1425 E	1454	N16 E85	5386	29 D	3	1428	4.34		2.70	
{ VOROSHILOV	20	2252	2311 D	S06 E50	5381	19 D	3	2256				112
KYOTO	20	2316 E	2324 D	S08 E52	5381	8 D	1	2316	1.66		1.47	110
KYOTO	21	0100	0125 D	S11 E59	5381	25 D	1	0105	1.45		1.46	100
ONDREJOV	21	1103 E	1117	S11 E50	5381	14 D	3	1108			2.90	Slow S-SWF
ONDREJOV	21	1220	1257	S07 E38	5381	37	3	1220			2.70	
KIEV	21	1220 E	1308 D	S09 E35	5381	48 D	2	1227	6.22			55
GOOD HOPE	21	1245 E	1305	S10 E36	5381	20 D	1	1245	3.60	4.60		
ONDREJOV	21	1339	1354	S11 E49	5381	15	3	1342	5.33		4.00	54
{ KYOTO	21	1340 E	1358 D	S12 E52	5381	18 D	2	1344	1.60	2.70		
GOOD HOPE	21	1341 E	1342 D	S12 E51	5381	1 D	1	1341				
KYOTO	23	0138 E	0149	S09 E15	5381	11 D	1	0138	3.12		1.83	120
SYDNEY	23	0346 E	0414 D	S06 E21	5381	28 D	2	0359	2.00	2.00		
{ SYDNEY	23	0419	0504	N30 E21	5379	45 D	2	0427	7.00	8.00		Slow S-SWF
KYOTO	23	0427 E	0451 D	N28 E19	5379	24 D	2	0427	12.46		2.18	130
{ SYDNEY	23	0428	0457	S07 E14	5381	29	1	0432	3.00	4.00		Slow S-SWF
KYOTO	23	0433 E	0451 D	S07 E14	5381	18 D	1	0443	2.70			100
GOOD HOPE	23	0614 E	0624	S03 W08	5382	10 D	1	0614	1.66		1.50	110
GOOD HOPE	23	0712	0747	N29 E12	5379	35	1	0715	1.30	1.40		
SYDNEY	23	2331 E	0038 D	N21 W19	5378	67 D	2	2345	3.00	3.00		
SYDNEY	24	0002	0033	N19 E50	5386	31	2	0011	1.50	2.00		
ALMA-ATA	24	0744 E	0811	S09 W05	5381	27 D	2	0750	13.61		2.50	64
ABASTUMANI	24	0744 E	0814 D	S08 E00	5381	30 D	3		4.53			71

COMMENCE - STANDARDS - BOLDER

SOLAR FLARES

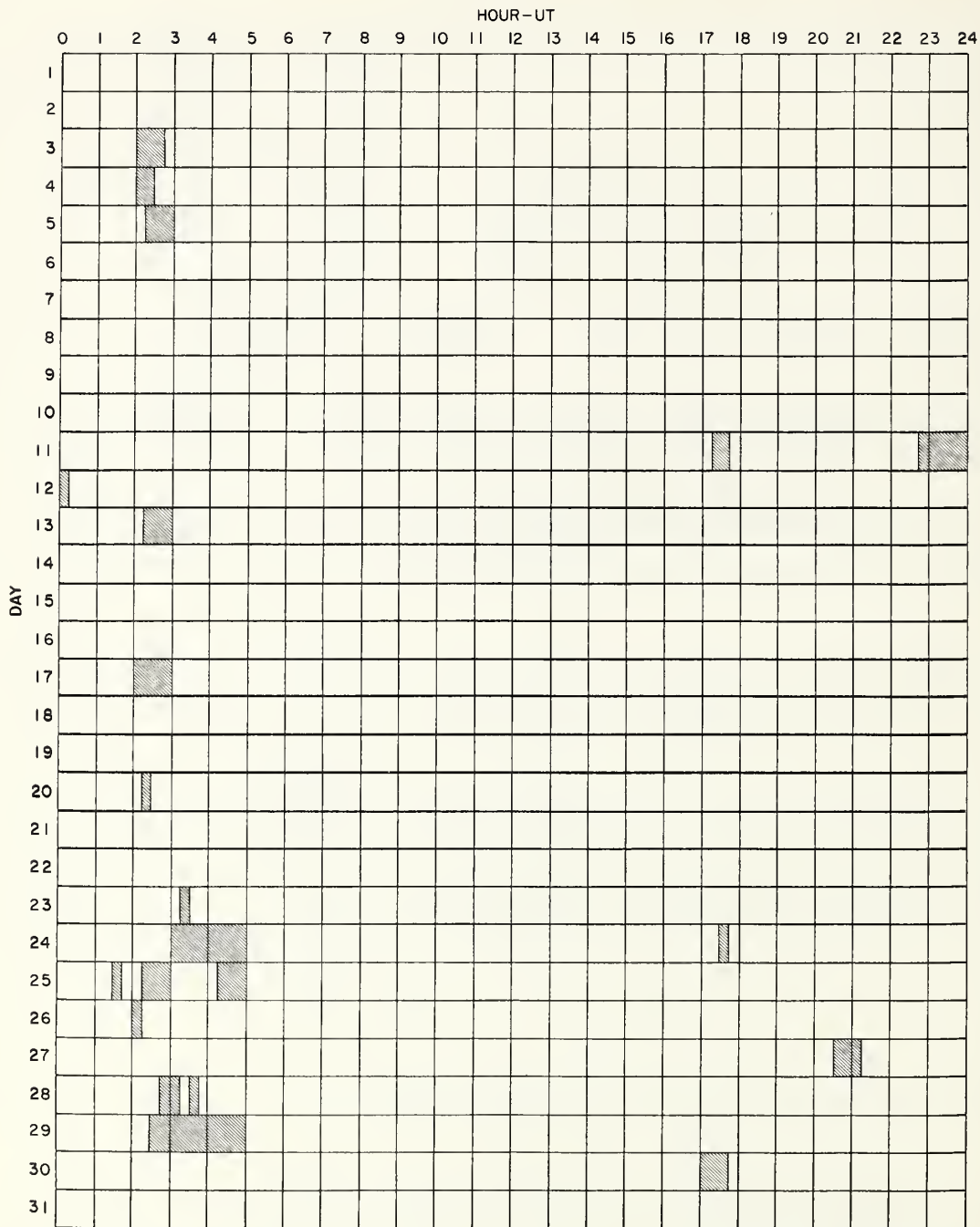
SEPTEMBER 1959

OBSERVATORY	DATE SEPT 1959	OBSERVED UNIVERSAL TIME		LOCATION			DURA- TION — MINUTES	IM- POR- TANCE	OBS. COND.	MEASUREMENTS				PROVISIONAL IONOSPHERIC EFFECT
		START	END	APPROX. LAT.	MER. DIST.	MC-MATH FLAGE REGION				TIME — U T	MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg.	MAX. WIDTH H _g	
TASHKENT	24	0746	0807 D	S07 E00		S381	21 D	1	3	0750	3.68		1.90	65
{ KRASNYA	25	1058 E	1111 D	S06 W18		S381	13 D	1	1	1058	2.18			75
	25	1110 E	1130	S07 W18		S381	20 D	16	3					
HUANCAYO	25	1519 E	1557	S07 W17		S381	38 D	1	2	1523	3.00	3.30	1.80	
SYDNEY	26	0235	0340	N20 W47		S378	5	1	2	0303	3.00	4.00		
ABASTUMANI	26	0858	0910 D	N27 W19		S379	12 D	1	2	0900	3.26			
{ GOOD HOPE	26	1254	1337	S05 W31		S381	43	1	2	1302	3.50	4.10		68
{ ONDREJOV	26	1307 E	1342	S07 W29		S381	35 D	16	3	1309			2.60	
{ ONDREJOV	26	1353	1412	S12 W22		S381	19	1	3	1356			2.80	
{ GOOD HOPE	26	1354	1412 D	S13 W26		S381	18 D	1	2	1355	3.00	3.50		
SYDNEY	26	2258 E	2349 D	N26 W82		S377	51 D	1	2	2320	1.00			
SYDNEY	27	0337	0406	N04 W65		S383	29	1	3	0354	.75	2.00		
SYDNEY	28	0420 E	0424 D	S03 W45		S381	4 D	1	2	0423	1.50	2.00		
{ SYDNEY	28	0517	0545 D	S12 W44		S381	28 D	1	2	0543	2.00	3.00		
TASHKENT	28	0523	0627	S15 W46		S381	64	1	3	0528	2.76		2.00	55
ABASTUMANI	28	0639	0658	S13 W47		S381	19	2	3	0644	5.44			105
KYOTO	28	0640	0655	S10 W40		S381	15	1	3	0645	2.91			100
ONDREJOV	28	0640	0700	S14 W46		S381	20	16	3	0649			2.80	
TASHKENT	28	0642	0742	S12 W46		S381	60	1	3	0646	3.68		1.80	75
SYDNEY	30	0308	0337	S08 W69		S381	29	2	2	0313	2.00	6.00		
{ SYDNEY	30	0310	0416	S11 W62		S381	66	1	2	0331	1.00	2.00		
SYDNEY	30	0345	0414	S02 W72		S381	29	1	2	0352	.50	2.00		
SYDNEY	30	0454	0507	N27 W68		S379	13	1	2	0458	.75	3.00		
GOOD HOPE	30	1309	1349	S19 E80		S401	40	1		1311	.90			
GOOD HOPE	30	1315	1327	S15 W85		S381	12	1		1319	1.10			

CAPRI G ANACAPRI - GERMAN
 CAPRI S ANACAPRI - SWEDISH
 GOOD HOPE ROYAL OBSERVATORY, CAPE OF GOOD HOPE
 KIEV* KIEV UNIVERSITY
 KODAIKANAL KODAIKANAL
 KRASNAYA KRASNAYA PAKHRA
 LOCKHEED LOS ANGELES
 MOSCOW-G MOSCOW - GAISH
 R O EDIN ROYAL OBSERVATORY, EDINBURGH
 R O HERST GREENWICH ROYAL OBSERVATORY, HERSTMONCEUX
 SAC PEAK SACRAMENTO PEAK
 SCHAUTINS SCHAUTINS
 USNRL UNITED STATES NAVAL RESEARCH LABORATORY
 SAC PEAK: ALL VALUES IN MAX. INT. COLUMN ARE ARBITRARY UNITS (0-40), NOT PERCENT OF CONTINUOUS SPECTRUM.
 E - LESS THAN & - PLUS
 D - GREATER THAN - - MINUS
 U - APPROXIMATE O - NOT REPORTED
 LOCKHEED OBSERVATIONS: ALL VALUES IN THE MAXIMUM INTENSITY COLUMN ARE ARBITRARY UNITS ON A SCALE OF 1 TO 4 - NOT PERCENT OF THE CONTINUOUS SPECTRUM.
 COMMERCIAL STANDARDS - BOULDER

INTERVALS OF NO FLARE PATROL OBSERVATIONS

SEPTEMBER 1959



Stations Include:

COMMERCE - STANDARDS - BOULDER - BOSTON - G.

Abastumani	Kodaikanal	Pirculi
Alma Ata	Krasnaya Pakhra	Royal Greenwich Observatory
Anacapri (Swedish)	Kyoto	Herstmonceux
Arcetri	Locarno	Sacramento Peak
Arosa	Lockheed	Simeiz
Athens	McMath	Sydney
Climax	Meudon	Tashkent
Dunsink	Mitaka	Uccle
Good Hope	Moscow G	Utrecht
Hawaii	Nederhorst	Voroshilov
Huancayo	Nizamia	Zurich
Kharkov	Ondrejov	

IONOSPHERIC EFFECTS OF SOLAR FLARES

IIIq

(Sudden Cosmic Noise Absorption
Sudden Enhancements Of Atmospherics)
Solar Noise Bursts At 18 Mc.

AUGUST 1959

AUGUST 1959	CLASS			WIDESPREAD INDEX	TIME (UNIVERSAL TIME)			PERCENT ABSORPTION SCNA	OBSERVATION STATIONS
	SCNA	SEA	Burst		BEGIN	MAX.	END		
1		<input type="checkbox"/>		1	1336	1341	1405		<u>DU</u>
1			1	4	1506		1512		<u>BO</u> , MC, SP
1			1	4	1625		1626		<u>BO</u> , MC
1			1	4	1710		1713		<u>BO</u> , MC, SP
1			2	5	1745		1750		<u>BO</u> , HA, MC, RE, SP
1			1	4	1808		1811		<u>BO</u> , MC, SP
1			1	5	2030		2035		<u>HA</u> , MC
2			1	5	2037		2038		<u>BO</u> , HA, MC, SP
2			1	5	2044		2046		<u>BO</u> , HA, SP
2			1	5	2108		2112		<u>BO</u> , HA, MC, SP
2			1	5	2114		2115		<u>BO</u> , HA, MC, SP
3		2		5	1507	1519	1626		A1, A3, A5, <u>DU</u>
3			1	5	1847		1849		<u>BO</u> , HA, MC, SP
3			1	5	1909		1910		<u>BO</u> , HA, MC
{ 3	2			5	2050	2055	2147	55	<u>BO</u> , HA, MC, RE
{ 3		2		5	2053	2105	2200		A1, A2, A3, A5, <u>BO</u> , HA
4		<input type="checkbox"/>		1	1030	1035	1106		<u>DU</u>
{ 4	1			1	1446	1455	1505		<u>MC</u>
{ 4		1		5	1446	1504	1539		A1, A5, <u>BO</u> , <u>DU</u>
4			1	4	1735		1737		<u>BO</u> , MC, SP
4			1	4	1901		1902		<u>BO</u> , MC
4	1			4	1916	1920	1935	15	<u>BO</u> , MC
5			1	1	0136		0144		<u>HA</u>
5	1			4	1629	1631	1637	10	<u>BO</u> , MC
5			1	5	2040		2042		<u>BO</u> , HA, SP
5	1			5	2125	2128	2133	10	<u>BO</u> , HA
5			1	5	2309		2310		<u>HA</u> , SP
6	1			1	0107	0109	0120	15	<u>HA</u>
{ 6	1			5	1501	1504	1514	15	<u>BO</u> , RE, SP
{ 6		1+		5	1501		1531		A1, A3, A5, <u>BO</u> , <u>KU</u> , PA, SP
{ 6			1	4	1749		1840		<u>BO</u> , MC, SP
{ 6		2		3	1752	1808	1850U		A3, <u>A5</u>
6			1	5	1929		1934		<u>BO</u> , HA, MC, SP
{ 6	1	1+		5	2001	2014	2028		A2, A3, A5, <u>HA</u>
{ 6				5	2003	2005	2017	15	<u>BO</u> , <u>HA</u> , MC, <u>SP</u>
6			1	5	2024		2026		<u>BO</u> , <u>HA</u> , MC, SP
6			2	5	2137		2150		<u>BO</u> , HA, MC, SP
6			2	1	2330		2350		<u>HA</u>
7			1	1	0251		0255		<u>HA</u>
7			1	5	1534		1536		<u>BO</u> , HA, MC, RE, SP
7	1			5	1600	1606	1630	20	<u>BO</u> , MC, RE, SP
7			1	4	1657		1701		<u>BO</u> , MC, SP
7			2	5	1734		1742		<u>BO</u> , HA, MC, RE, SP
7			1	5	2022		2026		<u>BO</u> , HA, MC
7			2	5	2108		2113		<u>BO</u> , HA, MC, SP
8			1	4	1719		1721		<u>BO</u> , MC
8		2		3	2120	2135	2215		A2, A3
9			1	5	1438		1440		<u>BO</u> , MC, RE, SP
9			2	5	1829		1841		<u>BO</u> , MC, RE, SP
10			1	4	1810		1813		<u>BO</u> , MC, SP
10			1	5	2159		2202		<u>BO</u> , HA, SP
11			1	5	1934		1936		<u>BO</u> , HA, MC, SP
11			1	5	1940		1941		<u>BO</u> , HA, MC, SP
11		1+		3	2008	2015	2020 U		A1, A3, <u>A5</u>
11			1	5	2324		2325		<u>HA</u> , SP
12			1	4	1724		1725		<u>BO</u> , MC
12			2	5	1950		1953		<u>BO</u> , HA, MC, SP
{ 14			2	5	1905		0154		<u>BO</u> , HA, (Noise Storm)
{ 14			3	5	2011		2013		<u>BO</u> , HA
15			2	4	1458		1502		<u>BO</u> , MC, SP
15			1	5	1800		0215		<u>BO</u> , HA, (Intermittent small
16			2	5	2046		2050		<u>BO</u> , HA, MC, SP bursts)

IONOSPHERIC EFFECTS OF SOLAR FLARES

(Sudden Cosmic Noise Absorption
Sudden Enhancements Of Atmospherics)
Solar Noise Bursts At 18 Mc.

AUGUST 1959

AUGUST 1959	CLASS			WIDESPREAD INDEX	TIME (UNIVERSAL TIME)			PERCENT ABSORPTION SCNA	OBSERVATION STATIONS	
	SCNA	SEA	Burst		BEGIN	MAX.	END			
{ 17 17 17 17 17	1-	1	1	1	1220	1223	1224	20	RE	
				5	1220	1227	1253		DU, PA	
		2		1	1224	1226	1240		RE	
				3	1440	1448	1515		DU, NE	
			1	4	1723		1724		BO, MC, SP	
17 { 17 17 17 17	2	1		4	1741		1742	55	BO, MC, SP	
				5	2047	2100	2130		A3, BO, HA, MC	
		2	2	5	2047		2050		BO, HA, MC, RE, SP	
				5	2050	2054	2115		BO, HA, MC, RE, SP	
			1	5	2342		2345		BO, HA, SP	
18 18 18 18 { 18	1	1	1	1	0132		0136	10	HA	
				1	0544		0612		HO	
		3		5	1026	1047 U			DU, PA	
				1	1407	1412	1430		MC	
		1	1	4	1619		1621		BO, MC, SP	
			4	1621	1633	1650	15	BO, MC, SP		
18 18 18 18 18			1	4	1750		1751		BO, MC, SP	
			1	4	1759		1800		BO, MC, SP	
			1	4	1808		1809		BO, MC, SP	
			1	4	1845		1846		BO, MC, SP	
			1	4	1858		1900		BO, MC, SP	
18 18 18 18 18			1	5	1920		1924		BO, HA, MC, SP	
			2	5	1933		1938		BO, HA, MC, RE, SP	
			1	5	1940		1942		BO, HA, MC, SP	
			1	5	2122		2123		BO, HA	
			1	5	2140		2145		BO, HA, MC, SP	
18 18 18 19 { 19 19 19	1		1	5	2155		2201	20	BO, HA, MC, SP	
			2	5	2224		2229		BO, HA, MC, SP	
			1	5	2246		2249		HA, MC	
		1+	5	5	1743	1745	1756		BO, MC, RE, SP	
			1	1	1750	1800	1810		A2	
19 19 19 20 20			1	4	1755		1757		BO, MC, SP	
			1+	1	1835	1845	1910 U		A2	
				1	4	1846			1858	BO, MC, SP (Group of bursts)
				1	5	1931			1933	BO, HA, MC, SP
				2	5	2244			2248	BO, HA, MC, SP
20 20 20 21 21 21		□	1	1	0926	0932	1014		DU	
			1	4	1846		1849		BO, MC, SP	
			1	4	1910		1912		BO, MC, SP	
			3	5	1932		1939		BO, HA, MC, SP	
			1	5	2314		2317		BO, HA	
21 21 21 21 21			1	1	1300		1313		MC	
			1	1	1446		1450		MC	
			1	3	1554		1603		MC, RE	
			2	5	5	1730			0047	BO, HA, MC, SP (Noise storm)
				2	5	1834	1855		1915	peaks 1857, 2008, 2122, 2215)
{ 22 22 22 22 22	2	2	1	1	0056	0059	0130	45	BO, HA, MC, RE, SP	
				1	0057	0105			HA	
		1+	4	4	1314	1327	1415		HA	
									DU, NE, PU	
{ 22 22 22 22 23	1	1	3	3	1512		1515	15	MC, RE	
				5	5	1519	1530			BO, MC, PA
		2	4	4	1520	1521	1540		BO, MC, RE, SP	
				5	5	1745			0130	BO, HA, MC, SP (Noise storm)
			3	5	1540		0043		BO, HA, MC, RE, SP (Noise storm)	
24 { 24 24 24 24	2	2	3	5	1435		0212	30	BO, HA, MC, RE, SP (Noise storm)	
				5	5	2239	2255		2330	BO, HA
		1	1	1	2240	2245	2300		BO	
				1	1	2325	2330		0000	BO
			2+	3	3	2330	2340		0040	A3, A5

(Sudden Cosmic Noise Absorption
Sudden Enhancements Of Atmospherics)
Solar Noise Bursts At 18 Mc.

AUGUST 1959

AUGUST 1959	CLASS			WIDESPREAD INDEX	TIME (UNIVERSAL TIME)			PERCENT ABSORPTION SCNA	OBSERVATION STATIONS
	SCNA	SEA	Burst		BEGIN	MAX.	END		
25			3	5	1230		0130		BO, HA, MC, RE, SP (Noise storm)
25		□		1	1650	1701	1808		DU
26			3	5	1330		0100		BO, HA, MC, SP (Noise storm)
27			2	5	1400		0210		BO, HA, MC, RE, SP (Noise storm peaks 1605, 1620, 2055)
27		2		3	1845	1855	1910		A2, A5
28	2			1	0037	0045	0100		HA
28			3	1	0113		0130		HA
28			2	5	1400		0130		BO, HA, MC (Noise storm)
{29	2		1	1	0205	0208	0216	50	HA
{29		1		1	0206		0226		HO
29			2	5	1345		0145		BO, HA, MC, (Noise storm)
29	1-			1	1449	1455	1510	20	RE
29		1		3	1510	1520	1530		A2, A3
{29	1			5	1727	1730	1740	25	BO, HA, MC, RE
{29		2		1	1728				FA
{30	1			4	1445	1450	1505	10	BO, MC
{30		1		1	1447		1515		FA
30			2	5	1515		0050		BO, HA, MC (Noise storm)
31			2	5	1330		0120		BO, HA, MC
{31		1+		1	1900	1910	1940		A2
{31	1			5	1900	1912	1945	25	BO, HA, MC, RE, SP
31	2			5	2244	2253	2320	45	BO, HA, MC, SP

COMMERCE - STANDARDS - BOULDER

Note: In July 1959 the records from Sacramento Peak, High Altitude and Hawaii Observatory were scaled side-by-side rather than separately and individually. Beginning with August 1959 the McMath-Hulbert Observatory records were scaled with the other three. By such intercomparison it is possible to discriminate between interference phenomena and small amplitude solar effects. It is also possible to report small events which on a single record might be overlooked.

IONOSPHERIC EFFECTS OF SOLAR FLARES

(SHORT-WAVE RADIO FADEOUTS)

NOVEMBER 1959

Nov. 1959	Start UT	End UT	Type	Wide Spread Index	Import- tance	Observation Stations	Known Flare, UT CRPL-F 184
4	2040	2120	S-SWF	4	1+	AD, <u>AN</u> , MC, OK	2048E
5	0554	0627	Slow S-SWF	1	1+	<u>OK</u>	
6	0138	0158	G-SWF	1	1	<u>OK</u>	0128
6	0214	0238	S-SWF	1	1-	<u>OK</u>	*
6	0458	0515	S-SWF	1	1	<u>OK</u>	*
9	0057	0112	S-SWF	1	1	<u>OK</u>	0053
10	0442	0505	S-SWF	1	1-	<u>OK</u>	
10	1105	1125	S-SWF	1	1	<u>PU</u>	*
10	1640	1708	S-SWF	5	2	<u>BE</u> , FM, HU, MC, PR, WS	1634
10	1858	1945	Slow S-SWF	5	2	AD, <u>BE</u> , HU, MC, PR, WS	1836
11	0345	0435	S-SWF	1	2	<u>OK</u>	
14	0210	0235	S-SWF	1	1+	<u>OK</u>	0216
14	0450	0522	S-SWF	5	1+	KO, <u>OK</u>	0502E
14	1713	1742	Slow S-SWF	5	1+	<u>BE</u> , FM, LA, MC, PR, WS	
15	0405	0433	Slow S-SWF	1	1+	<u>OK</u>	0352
18	2330	2358	Slow S-SWF	5	2	AD, CA, <u>OK</u>	2326
21	0510	0600	S-SWF	1	2	<u>OK</u>	
26	0750	0814	Slow S-SWF	1	2	<u>KO</u>	0746
26	0930	1016	S-SWF	3	1+	NE, <u>PU</u>	0926
28	1220	1320	Slow S-SWF	4	1+	NE, <u>PR</u>	1207
28	2010	2045	Slow S-SWF	5	2	AD, AN, BE, FM, HU, LA, <u>MC</u> , PR, WS	2010
29	1347	1427	Slow S-SWF	3	2	HU, <u>PR</u>	1345E
29	1843	1942	S-SWF	5	2+	AD, AN, BE, FM, HU, LA, MC, <u>PR</u> , WS	1816
30	0249	0320	S-SWF	5	3-	AD, <u>NE</u> , OK, TO, <u>CW+</u>	0247
30	1735	1822	Slow S-SWF	5	3-	<u>BE</u> , FM, LA, MC, NE, PA, PR, WS, <u>CW***</u>	1720

CA = Canberra, Australia

KO = Kodaikanal, India

LA = Los Angeles, Calif.

NE = Nederhorst den Berg, Netherlands

PA = Paramaribo, Dutch Guiana

PU = Prague, Czechoslovakia

TO = Hiraio Radio Wave Observatory, Japan

CW* = Cable and Wireless, Barbados

CW** = Cable and Wireless, Somerton, England

CW*** = Cable and Wireless, Brentwood, England

CW+ = Cable and Wireless, Hong Kong

CW++ = Cable and Wireless, Singapore

COMMERCE - STANDARDS - BOULDER

SOLAR RADIO EMISSION OUTSTANDING OCCURRENCES

IVa

Ottawa

DECEMBER 1959

2800 Mc

Dec. 1959	Type*	Start UT	Duration Hrs:Mins	Maximum		Remarks
				Time UT	Peak Flux	
1	3 Simple 3	b1522	>5 30	indet.	50	In sunrise oscillations
2	2 Simple 2 f	1245	12	1247.5	875	
	4 Post Increase A		2 50		35	
	2 Simple 2	1321	6	1322.5	15	
2	2 Simple 2 f	1815.5	1.5	1816.1	15	
3	3 Simple 3 A	1757	>2 50	indet.	35	
	2 Simple 2	1800	5	1801.7	100	
4	3 Simple 3 A	1517	35	indet.	8	
	8 Group (2)	1517.5	7			
	2 Simple 2	1517.5	4	1519	18	
	2 Simple 2	1522.5	2	1523	20	In interference
4	3 Simple 3 A	1815	2 15	indet.	35	
	2 Simple 2	1815	15	1822	120	
5	3 Simple 3 A	1616.5	1 05	indet.	7	
	2 Simple 2 f	1616.5	5	1617.5	55	
6	2 Simple 2	1634.5	4	1635.4	35	
13	3 Simple 3	1941	55	indet.	7	
15	3 Simple 3 A	1928	55	indet.	5	
	2 Simple 2	1929.3	4	1930	12	
22	1 Simple 1	1611	5	1613	5	
23	6 Complex	1644	6	1648	10	
	4 Post Increase		18		5	
27	1 Simple 1	1530	5	1532.3	7	
27	6 Complex	1953.5	3	1954.7	160	Doubtful (in interference)

COMMERCE - STANDARD - BOULDER

HOURS OF OBSERVATION: OCTOBER, NOVEMBER, DECEMBER 1959

OBSERVING PERIOD:

October 1200 UT - 2150 UT (approx.)
November 1255 UT - 2100 UT (approx.)
December 1320 UT - 2045 UT (approx.)

with the following exceptions:

- (1) No observations: October 23 - 1535-1855
October 27 - all day
October 28 - all day
October 29 - all day
October 30 - all day
- (2) Observations for calibration purposes only:
October 24, 25, 26
- (3) Observations commenced:
October 4 - 1530
October 12 - 1525
October 22 - 1535
- (4) Observations ended: October 22 - 2035
October 23 - 2040
- (5) Continuous observations on all days have been interrupted for receiver calibration and by sporadic interference.

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES
DECEMBER 1959

BOULDER

167 MC

Dec. 1959	Type	Start UT	Time of Maximum UT	Duration Minutes	Intensity
1	8	1513.5	1516.5	5	2
1	3	1534.1	1534.1	0.4	2
1	3	1543.0	1543.0	0.2	2
1	3	1558.0	1558.0	0.1	1
1	3	1639.0	1639.0	0.1	1
1	7	1750 E		332 D	2
2	6	1445 E		517 D	2
3	6	1404 E		557 D	1
3	3	1501.0	1501.8	1.0	2
4	3	1556.8	1556.8	0.3	2
4	3	1615.1	1615.1	0.6	2
4	3	1702.2	1703.1	1.3	2
4	3	1756.0	1756.0	1.0	2
4	3	1821.7	1822.0	0.6	2
4	3	1911.7	1911.7	0.1	2
4	3	1939.4	1939.4	0.3	2
4	3	2009.0	2009.0	0.4	2
4	3	2206.7	2206.7	0.2	2
4	2	2304.2	2304.2	4.6	2**
4	3	2317.0	2317.0	0.2	2**
5	6	1409 E		177 D	2
5	2	1457.0	1458.2	1.8	3
5	3	1516.5	1516.8	1.3	3
5	2	1701.5	1703.9	5.0	3
5	8	1817.2	1820	6	3
5	2	1907.6	1908.6	8	3
5	3	1924.5	1924.5	1.0	2
5	8	1931.0	1933.7	6	3
5	2	2035	2037.8	12	2
5	3	2057.5	2057.5	0.3	2
5	2	2201.3	2202.1	6	2
5	3	2233.6	2233.7	0.4	2
5	3	2241.2	2242.1	1.4	3
6	2	1511.5	1512.8	2.6	2
6	3	1739.9	1739.9	0.2	2
6	3	1806.8	1807.0	0.6	2
6	2	1839.7	1840.1	1.6	2
6	6	1903		259 D	2
7	3	1618.2	1618.2	0.2	1
7	2	1622.5	1622.6	2.6	2
7	3	1630.0	1630.9	2.0	3
7	3	1645.5	1645.5	0.3	1
7	3	1751.2	1757.8	1.0	2
7	3	1853.0	1853.9	1.5	3
7	3	1924.9	1924.9	0.2	2
7	2	1931	1931.8	5	3
7	3	2018.9	2018.9	0.2	2
7	2	2037.8	2037.8	2.0	2
7	3	2309.2	2309.5	1.3	2**
7	3	2311.0	2311.5	1.1	2**
8	3	1420.8	1420.8	0.1	1*
8	2	1422.5	1423.4	1.6	2*
8	3	1942.0	1942.0	0.8	3
9	3	1752.0	1752.0	0.2	2
10	3	2200.5	2200.5	0.1	1

Dec. 1959	Type	Start UT	Time of Maximum UT	Duration Minutes	Intensity
10	3	2210.5	2210.5	0.2	1
10	3	2221.6	2221.6	0.1	1
10	2	2234.3	2236.2	1.6	1
10	3	2243.8	2244.9	2.5	2
10	2	2312.6	2313.8	3.0	1**
10	3	2318.7	2318.7	0.1	2**
11	3	1918.3	1918.3	0.1	1
14	7	1735		145	1
14	3	2209.0	2209.5	1.0	1
15	3	1703.0	1703.0	0.2	2
15	3	2215.8	2215.8	0.1	1
15	2	2233.8	2234.2	1.6	1
16	2	1508.4	1508.5	2.6	2
16	3	1937.5	1938.2	1.1	1
17	3	1825.0	1825.3	1.0	2
17	3	2311.5	2311.5	0.1	1**
18	3	1753.0	1753.1	0.2	2
18	3	1821.6	1921.6	0.1	1
18	3	1848.5	1848.5	0.1	1
19	3	1537.0	1537.0	0.1	1
19	3	1704.0	1704.0	0.1	1
19	7	1736		348 D	1
19	2	1739.3	1741.0	4.7	2
19	3	2156.5	2157.0	2.5	2
20	3	1831.8	1831.8	0.1	1
20	3	1839.8	1839.8	0.2	2
20	3	1853.9	1853.9	0.1	1
20	2	2019.5	2019.9	3.5	1
20	3	2105.2	2105.2	0.1	1
20	3	2122.9	2122.9	0.2	1
20	2	2143.0	2144.0	2.0	2
21	6	1419 E		123 D	2
22	6	1419 E	1820	405 D	2
22	3	2206.8	2206.8	0.2	1
22	3	2231.2	2231.2	0.1	1
22	2	2232.8	2233.2	1.2	1
23	2	1647	1701	36	2
23	3	1716.5	1717.5	0.3	1
23	3	1735.2	1735.2	0.1	2
23	3	1750.8	1750.8	0.2	1
23	3	2130.8	2131.2	0.4	2
23	2	2142.4	2142.9	1.6	2
24	2	1845.5	1846.1	1.0	1
24	2	2029.1	2030.0	1.9	2
24	3	2102.3	2102.3	0.3	1
24	2	2222.8	2224.0	3.2	1
24	3	2231.9	2231.9	0.1	1
24	2	2246	2250	6.0	2**
25	2	1740.6	1742.0	1.5	1
25	3	1804.0	1804.0	0.1	1
25	3	1900.5	1900.5	0.1	1
25	3	1911.8	1911.8	0.2	1
27	6	1421 E		548 D	2
28	6	1421 E		549 D	2
29	6	1420 E	1540	202	2

COMMERCE - STANDARDS - BOULDER

SOLAR RADIO EMISSION OUTSTANDING OCCURRENCES

BOULDER

DECEMBER 1959

167 MC

Dec. 1959	Type	Start UT	Time of Maximum UT	Duration Minutes	Intensity
29	3	1806.5	1806.5	0.1	1
29	3	1824.0	1824.0	0.1	1
29	3	1909.0	1909.0	0.2	1
29	3	2207.1	2207.1	0.1	2
29	2	2251.0	2251.2	3.8	2
29	2	2312	2314	12	2**
30	3	2324.0	2324.0	0.2	2**
30	3	2327.5	2327.5	0.1	2**
31	3	1433.0	1433.0	0.2	2*
31	3	1556.5	1556.5	0.1	2

Dec. 1959	Type	Start UT	Time of Maximum UT	Duration Minutes	Intensity
31	3	1612.0	1612.0	0.2	1
31	7	1640		194	2
31	3	2107.6	2107.6	0.3	2
31	2	2121.0	2121.0	1.2	2
31	3	2145.0	2145.8	1.0	2
31	3	2324.6	2324.6	0.1	2**

* On sunrise pattern.
** On sunset pattern.

TIMES OF OBSERVATIONS

Dec. 1959	U.T.	Dec. 1959	
1	1402-1653	16	1415-2324
	1750-2322	17	1415-2323 I 2000-2300
2	1445-2322	18	1416-2324 I 2100-2315
3	1404-2321 I 2000-2100	19	1416-2324
4	1405-2322	20	1417-2324
5	1409-2322	21	1419-1630
6	1408-2322		2018-2325
7	1407-2321 I 2045-2300	22	1419-2326
8	1408-2321	23	1420-2322
9	1409-2321 I Throughout day	24	1419-2327
10	1411-1637	25	1421-2327
	2022-2322	26	1421-2329
11	1412-2322	27	1421-2329
12	1414-2322	28	1420-2330
13	1415-2322	29	1420-2330
14	1415-2322	30	1422-2330
15	1415-2322	31	1422-2330

COMMERCE - STANDARDS - BOULDER

SOLAR RADIO EMISSION

OUTSTANDING OCCURRENCES

AUGUST 1959

HAWAII

200 MC

Aug. 1959	Type	Start UT	Time of Maximum UT	Duration Minutes	Remarks
8	6	1900 E	2017.3	115 D	
	3	2149.5	2150.0	1.0	
10	3	0121.3	0121.4	0.2	Small int.
	3	2159.5	2159.6	0.2	
12	3	0205.8	0205.9	1.5	
	3	0306.8	0306.9	0.3	Small int.
13	3	2036.9	2037.1	0.7	
	3	2047.3	2047.6	0.7	Small int.
	2	2124.3	2125.7	4.0	Small int.
	3	2247.6	2248.0	1.4	
14	3	0023.5	0023.6	0.5	Small int.
	0	0148.0		126 D	*
15	3	1827.5	1827.8	0.3	
17	8	0329	0331.0	8.0	Off scale
	3	2047.6	2048.8	1.2	Off scale
17	1	2052.0	2202.3	85.5	
18	3	0133.0	0133.3	0.5	Small int.
	2	2015.0	2023.8	9.5	Small int.
	2	2140.4	2145.0	5.1	Small int.
	2	2220.3	2226.7	7.8	Small int.
19	3	1848.8	1850.5	4.3	Small int.
	3	2245.7	2246.0	0.5	Off scale
20	3	1928.7	1929.0	0.6	
	2	1932.7	1933.2	2.2	Medium int.
	3	1936.5	1936.7	0.3	

Aug. 1959	Type	Start UT	Time of Maximum UT	Duration Minutes	Remarks
21	3	1835.4	1835.6	0.3	
	3	1850.0	1851.2	1.8	
23	3	0228.5	0228.7	0.6	Small int.
25	2	2109.5	2110.8	9.7	
	3	2246.7	2247.1	0.5	
26	3	0128.6	0129.1	0.7	
	6	1825 E		560 D	**
27	1	1823 E		553 D	+
28	0	0116		12	
	1	1830 E		189 D	Small int.
29	1	0147.0	0209.0	110 D	++
	3	0208.3	0209.0	1.2	Off scale
	6	1825 E		559 D	#
30	1	1820 E	2348.8	568 D	##
	3	2348.7	2348.8	2.0	
31	0	1855		36	

* Series of small bursts associated with rise from 0148 to 0247.3 UT; off scale from 0234-0245 UT.

** Medium activity continues beyond 0345 UT Aug. 27

+ Small intensity, activity continues beyond 0336 UT Aug 28

++ Small intensity, activity continues beyond 0337 UT.

Continues beyond 0344 UT. Aug 30

Small intensity, activity continues beyond 0348 UT Aug 31

TIMES OF OBSERVATIONS

Aug. 1959	U.T.	Aug. 1959	U.T.	Aug. 1959	U.T.
7	1814-2400	15	1820-2400	24	0000-0349
8	0000-0305	16	0000-0352		1840-2400
	1900-2400	17	0000-0352	25	0000-0335
9	0000-0350		1845-2400		1935-2400
	1830-2400	18	0000-0351	26	0000-0333
10	0000-0356		1830-2400		1825-2400
	1823-2400	19	0000-0341	27	0000-0345
11	1803-2400		1835-2400		1823-2400
12	0000-0341	20	0000-0150	28	0000-0336
	1820-2400		1859-2400		1830-2400
13	0000-0353	21	0000-0342	29	0000-0337
	1820-2400		1822-2400		1825-2400
14	0000-0354	22	0000-0343	30	0000-0344
	1800-2400		1815-2400		1820-2400
15	0000-0355	23	0000-0350	31	0000-0348
			1825-2400		1800-2220

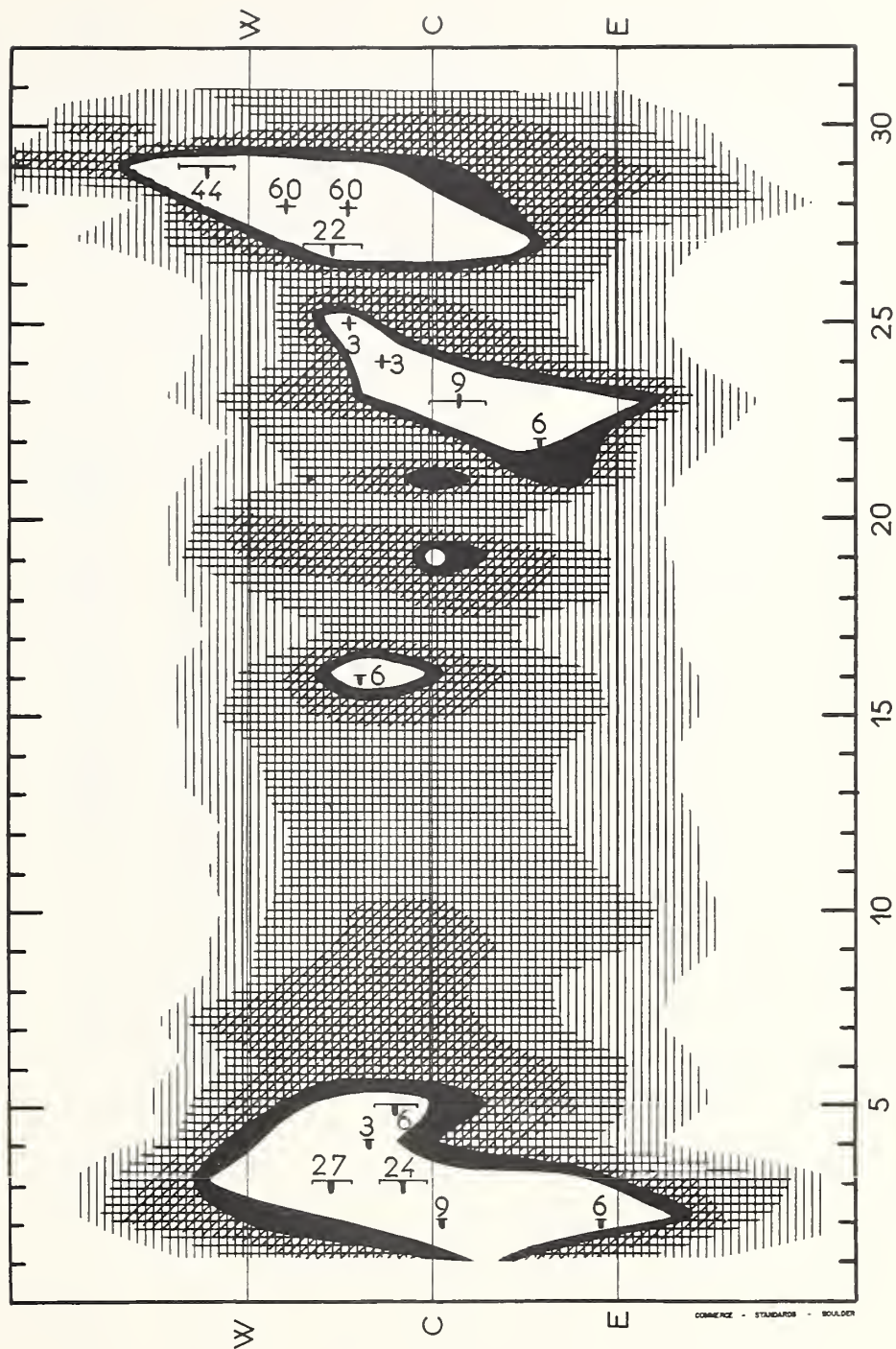
COMMERCE - STANDARDS - BOULDER

SOLAR RADIO EMISSION INTERFEROMETRIC OBSERVATIONS

DECEMBER 1959

Nancay

169 Mc



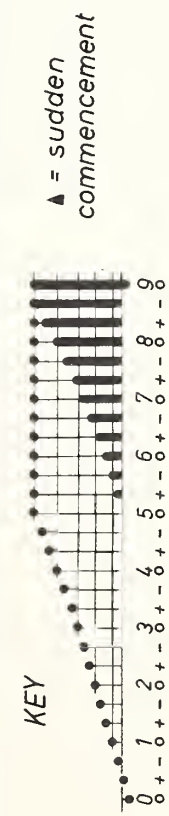
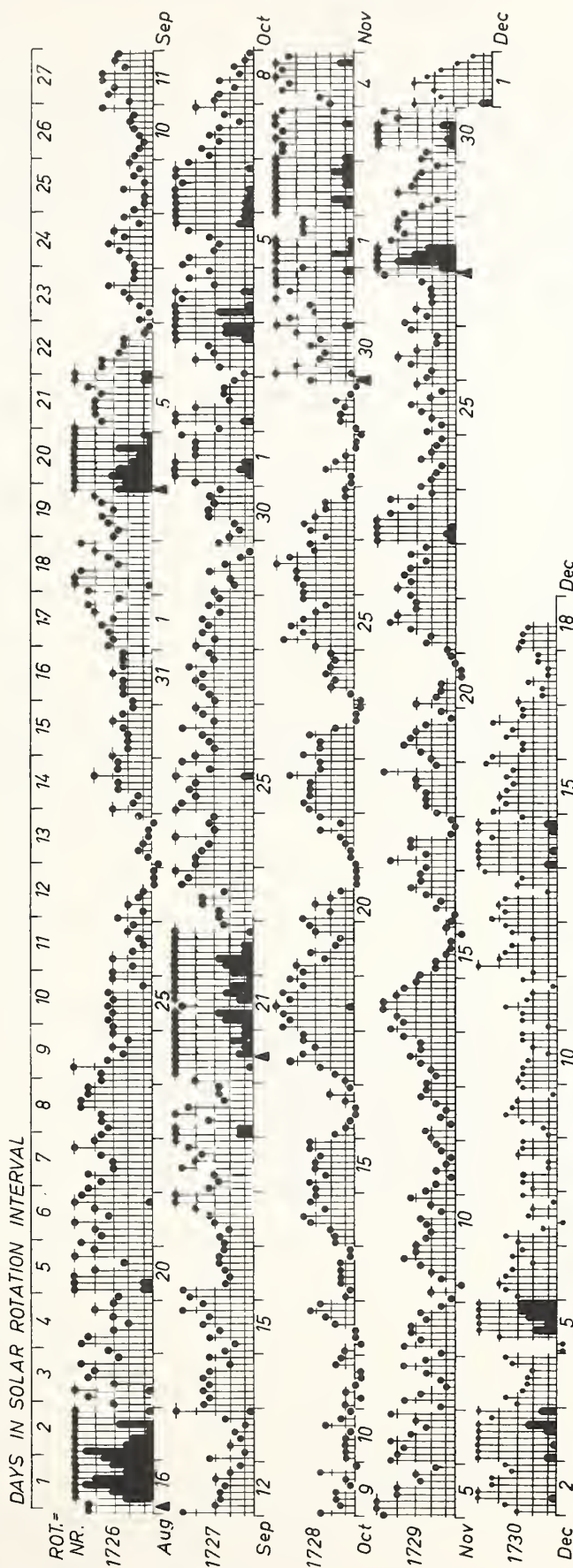
DECEMBER 1959

GEOMAGNETIC ACTIVITY INDICES

NOVEMBER 1959

Nov. 1959	C	Values Kp								Sum	Ap	Final Selected Days	
		Three hour Gr. interval											
		1	2	3	4	5	6	7	8				
1	1.3	4-	5o	6+	5+	5+	4-	4-	4-	37-	43	Five Quiet	
2	1.6	5o	6-	6+	5o	6-	6-	6+	6-	45+	69		
3	1.4	6-	5-	5-	5o	5-	6-	5o	5-	40o	48		
4	1.3	2o	3-	5-	4+	5o	5-	6o	4+	34-	36		11
5	1.1	5-	5o	5o	4o	4o	3-	3o	2-	31-	28		12
												15	
6	1.1	4+	4o	4-	4+	3+	2+	3o	4+	29+	23	20	
7	0.7	1+	4-	3-	1o	1+	2+	4-	2+	18+	11	24	
8	0.6	1+	4-	3-	3+	3+	2+	3-	1+	21-	13		
9	0.7	1-	2o	0o	1+	2o	3-	4-	3o	15+	9		
10	0.6	3o	2+	2o	2+	3-	1+	2o	3+	19o	10		
11	0.1	2+	2-	1-	2-	1o	1-	1+	2-	11o	5	Five Disturbed	
12	0.2	2o	2+	1-	1+	1o	2-	3-	2+	14o	7		
13	0.8	2+	2-	2o	3-	3+	3-	3-	4-	21o	12		
14	1.2	4+	4-	4o	5-	5-	4o	4-	3o	32o	28		1
15	0.1	3-	2-	2-	1o	1-	1-	0o	1o	9+	5		2
												3	
16	0.5	1-	0+	2-	1+	2+	3+	3-	3-	15o	8	28	
17	0.5	2+	4+	2+	3+	3+	1-	0+	1-	17+	12	30	
18	0.9	2-	2+	2+	2+	3o	3o	5-	2-	21o	14		
19	0.5	2o	3-	4-	3+	3o	2+	1-	1+	19o	11		
20	0.1	3o	2-	1+	1+	0o	0o	0+	1-	8+	4		
21	1.0	1o	2+	2o	3+	4+	4o	3o	3o	23o	16	Ten Quiet	
22	1.0	3+	4o	3+	4-	3+	2+	3+	2+	26-	17		
23	1.4	5+	6-	5+	5o	4+	3+	4+	2o	35+	40		
24	0.2	3-	2o	2-	1+	3-	2o	2-	1+	15+	8		7
25	0.6	2+	1+	2o	3-	3+	2o	1+	3o	18o	10		9
												10	
26	0.7	2+	2o	3+	4o	3o	2-	2-	3+	21+	13	11	
27	0.8	4-	2+	3o	2o	2o	2o	3-	5-	22+	15	12	
28	1.7	6o	8o	7+	7-	4+	4-	4o	4o	44o	82	15	
29	0.8	4-	3-	2-	4o	3+	3o	3-	2-	23-	15	16	
30	1.4	3-	2+	5+	6-	5+	6o	4o	5-	36o	43	20	
												24	
												25	
Mean:		0.83								Mean:		22	

COMMERCE - STANDARDS - BOULDER



PLANETARY MAGNETIC
THREE-HOUR-RANGE INDICES
Kp till 1959 Nov.30
(Ks from Wingst and Göttingen till 1959 Dec.18)

CRPL RADIO PROPAGATION QUALITY FIGURES AND FORECASTS

NORTH ATLANTIC

NOVEMBER 1959

Nov. 1959	North Atlantic 6-hourly quality figures				Short-term forecasts issued about one hour in advance of:				Whole day index	Advance forecasts (J-reports) for whole day; issued in advance by:				Geomag- netic K _{Fr}	
	00 to 06	06 to 12	12 to 18	18 to 24	00	06	12	18		1-7 days Final	1-7 days Js	1-7 days SDW	1-7 days J	Half Day (1) (2)	
1	5-	4+	6o	5+	5	4	5	5	5o	6			6	(4) 3	
2	3+	2+	5o	3+	5	4	6	5	(3+)	6			6	(4) (4)	
3	4-	3+	6o	4+	3	3	6	4	(4o)	4	4		7	(5) 3	
4	5+	5-	6-	4+	4	4	6	5	5o	4	4		7	3 (4)	
5	5-	4+	6+	6-	5	4	6	5	5o	5			5	(5) 2	
6	5-	5+	7-	5+	5	5	6	6	6-	6			6	(4) 3	
7	5o	5+	7o	6o	5	5	6	6	6-	6			6	1 2	
8	5-	5+	7-	6+	5	5	7	6	6-	7			7	3 2	
9	6+	6-	7o	6+	5	6	7	7	6+	7			7	1 2	
10	7-	7-	7+	7-	6	6	7	7	7-	7			7	2 2	
11	7o	6-	7o	7-	7	7	7	7	7-	7			7	1 1	
12	7-	6+	7+	7o	7	6	7	7	7-	7			7	1 2	
13	7-	6+	7+	6+	7	6	7	7	7-	6			6	2 3	
14	6-	6o	7o	6+	6	6	7	6	6+	5			5	3 3	
15	6o	6+	7o	7-	6	6	7	7	7-	5			5	2 1	
16	6+	6+	7o	6-	7	6	7	7	6+	6			6	0 3	
17	6o	6+	7-	7o	6	6	7	6	6+	7			7	2 1	
18	7-	7-	7o	6o	6	6	7	7	7-	7			7	2 3	
19	5+	5o	7-	7-	6	6	7	6	6o	7			7	2 2	
20	7-	6+	7o	7-	6	6	7	7	7-	7			7	2 0	
21	6+	6+	7-	6+	7	6	7	6	6+	7			7	2 3	
22	6+	6+	7o	7-	5	5	7	7	7-	7			7	3 3	
23	4o	4o	6+	6-	6	4	5	5	5-	7			7	(5) 3	
24	5+	4+	7o	6+	4	4	6	6	6-	4	4		7	2 1	
25	6-	6o	7+	7-	6	6	7	7	7-	5	5		7	2 1	
26	6o	6o	8-	7o	6	6	6	6	7-	7			7	3 3	
27	7-	7o	7+	6o	6	6	7	7	7-	7			7	2 3	
28	3+	3+	7-	6o	6	3	5	5	(4+)	6			6	(6) 3	
29	6o	6+	7-	6+	5	5	6	6	6+	5			5	3 2	
30	5+	6-	6+	5+	6	5	6	5	6-	4			4	(4) (4)	
Score: Quiet Periods					P	13	14	21	15	12				13	
					S	13	9	7	12	10				10	
					U	0	0	2	0	3				3	
					F	0	0	0	0	2				1	
Disturbed Periods					P	0	6	0	1	1				0	
					S	1	0	0	1	0				0	
					U	1	1	0	1	0				0	
					F	2	0	0	0	2				3	

() represent disturbed values.

CRPL RADIO PROPAGATION QUALITY FIGURES AND FORECASTS NORTH ATLANTIC

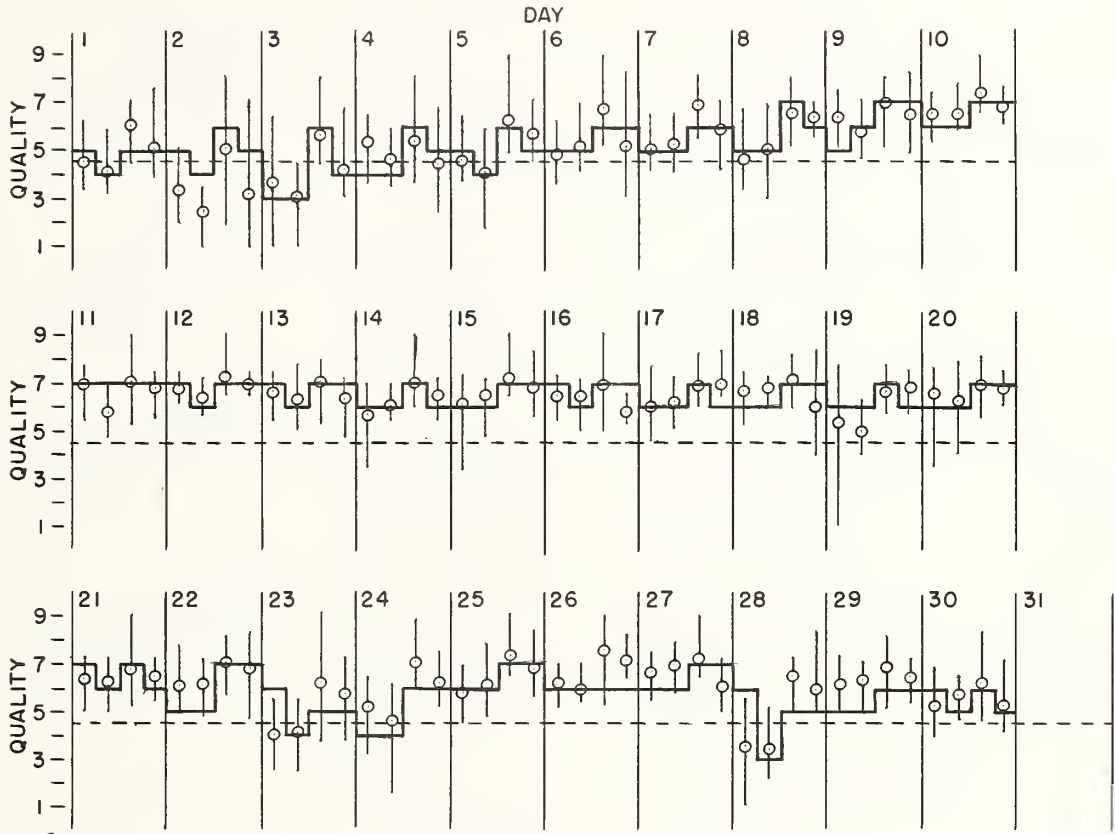
V1b

— Short-term forecast

NOVEMBER 1959

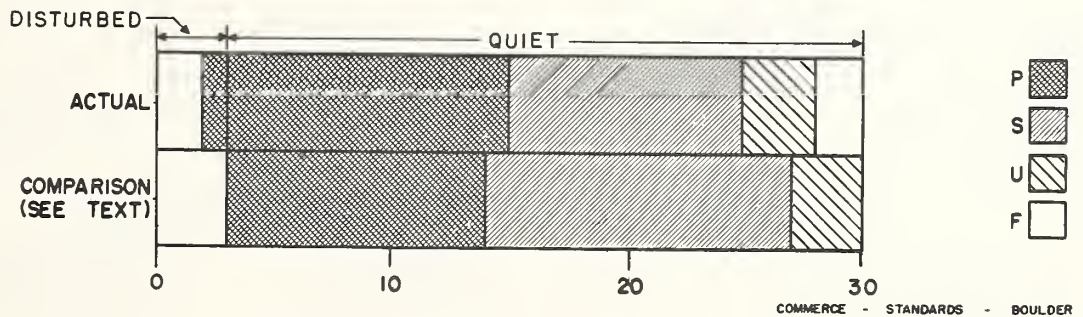
| Range of reports

o Quality figure

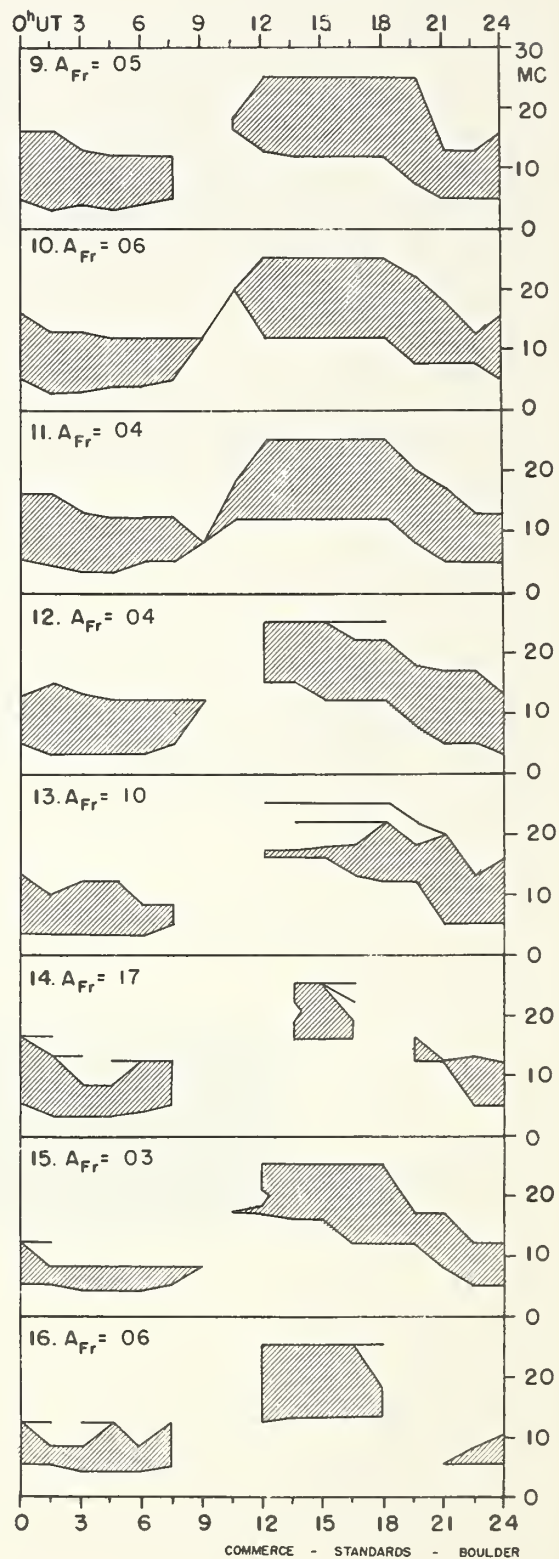
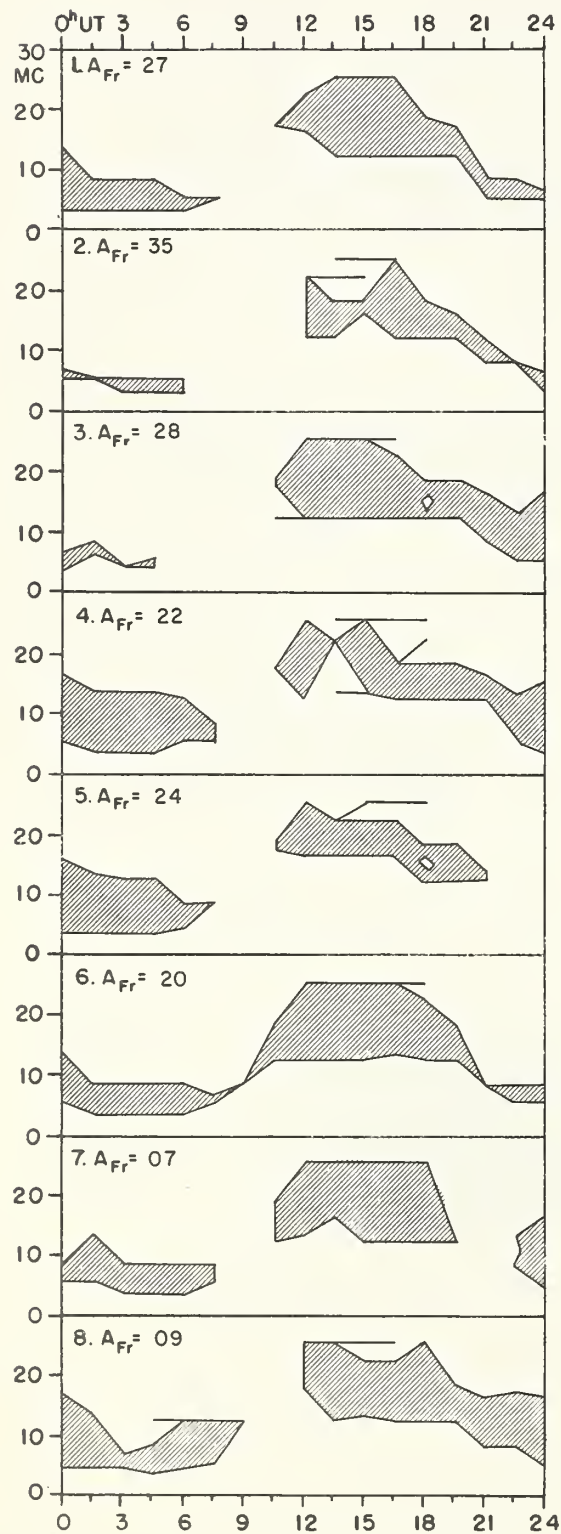


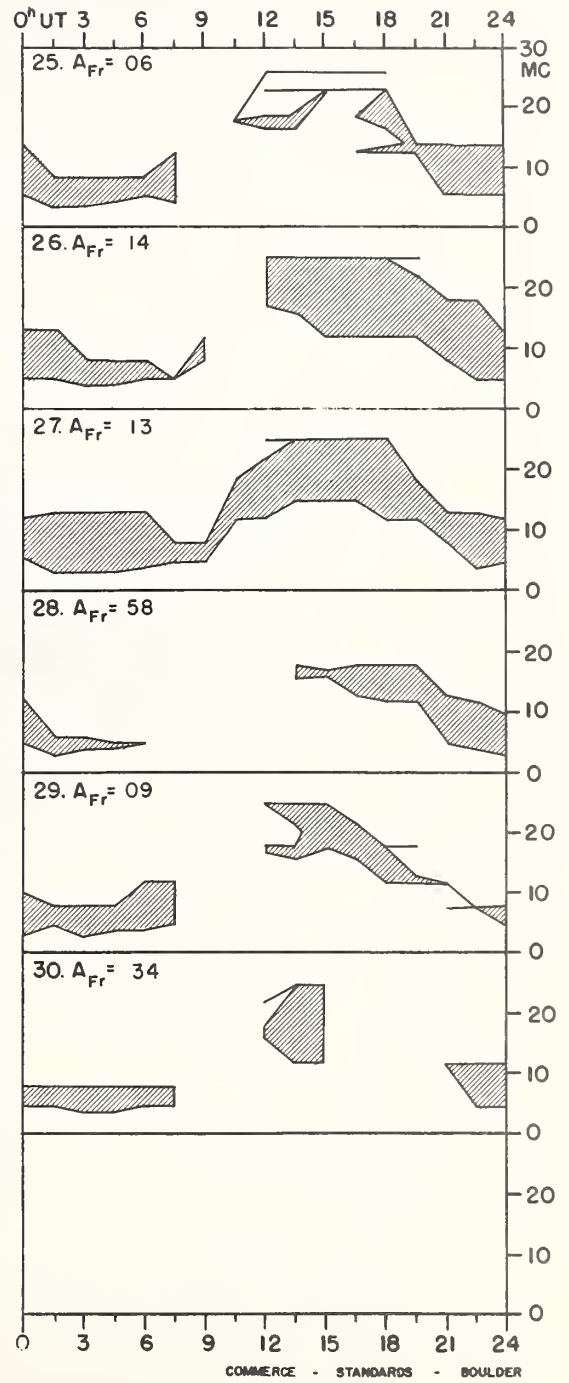
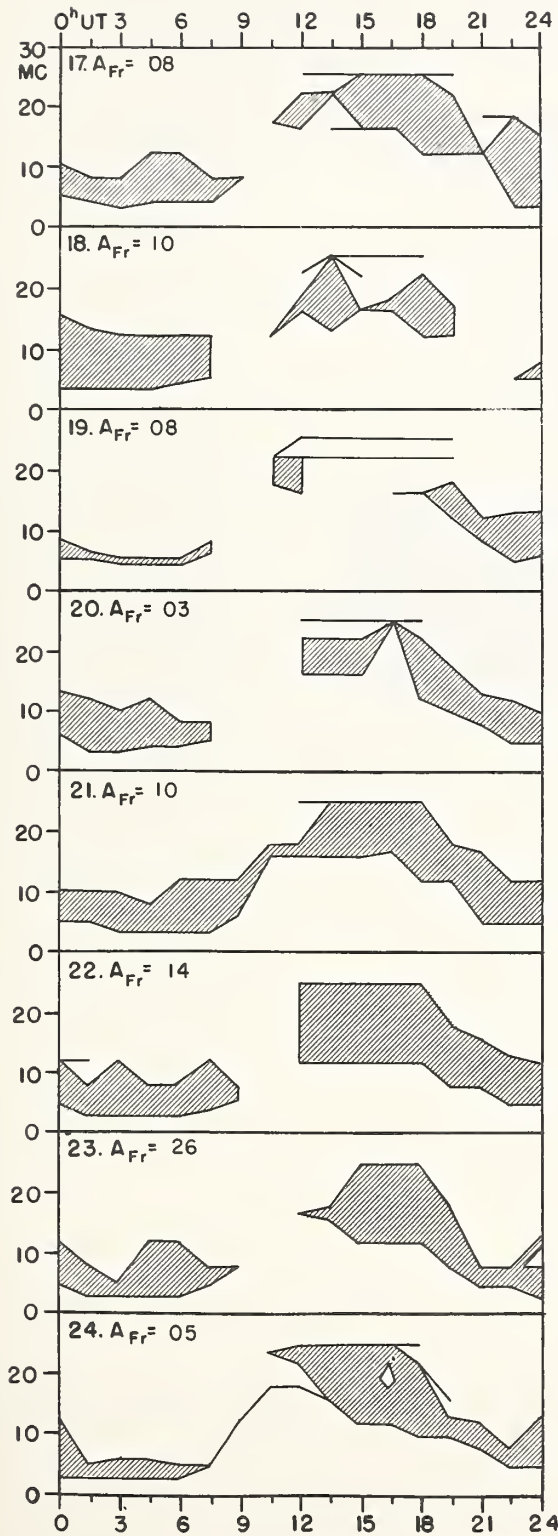
OUTCOME OF ADVANCED FORECASTS

FINAL ESTIMATE



NOVEMBER 1959





CRPL RADIO PROPAGATION QUALITY FIGURES AND FORECASTS

NORTH PACIFIC

NOVEMBER 1959

Nov. 1959	North Pacific 12-hourly quality figures		Short-term fore- casts issued at		Whole day index	Advance forecasts (Jp reports) for whole day; issued in advance by:				Geomag- netic K _{SI}	
	0700 to 1900	1900 to 0700	0600	1800		1-7 days Final	1-7 days Jps	1-7 days SDW	1-7 days Jp	Half (1)	Day (2)
1	3	3	4	4	(4)	6			6	(6)	(5)
2	3	3	3	4	(2)	6			6	(6)	(5)
3	3	5	4	4	(4)	6			6	(6)	(5)
4	4	5	6	5	(4)	6			6	(4)	(4)
5	5	5	4	5	5	5			5	(5)	3
6	6	5	5	6	5	5			5	(4)	3
7	5	5	6	6	5	6			6	2	2
8	6	4	5	6	6	6			6	3	3
9	5	5	5	6	5	6			6	0	2
10	6	5	6	5	5	6			6	2	2
11	6	5	5	6	6	6			6	1	1
12	6	6	6	6	6	6			6	1	1
13	6	6	6	6	6	6			6	2	2
14	5	6	6	5	6	5			5	(4)	(4)
15	5	5	5	6	6	5			5	1	0
16	5	6	5	5	5	5			5	1	3
17	5	6	5	6	6	6			6	3	2
18	6	6	6	5	6	6			6	2	3
19	6	5	6	6	6	5			5	3	2
20	6	5	6	6	6	6			6	1	0
21	7	5	6	6	6	6			6	2	(4)
22	6	5	5	6	6	6			6	3	3
23	5	5	4	5	5	6			6	(6)	(4)
24	5	5	5	6	5	6			6	1	2
25	6	5	6	6	6	6			6	2	2
26	6	6	6	6	6	6			6	3	2
27	6	5	6	6	6	6			6	2	2
28	4	6	4	5	5	5			5	(7)	(4)
29	5	6	5	6	6	4			4	2	3
30	4	5	5	5	5	4			4	(4)	(5)
Score: Quiet Periods P 15 10 16 S 9 17 9 U 0 0 0 F 0 0 1 Disturbed Periods P 2 0 0 S 3 2 0 U 0 0 0 F 1 1 4											

() represent disturbed values.

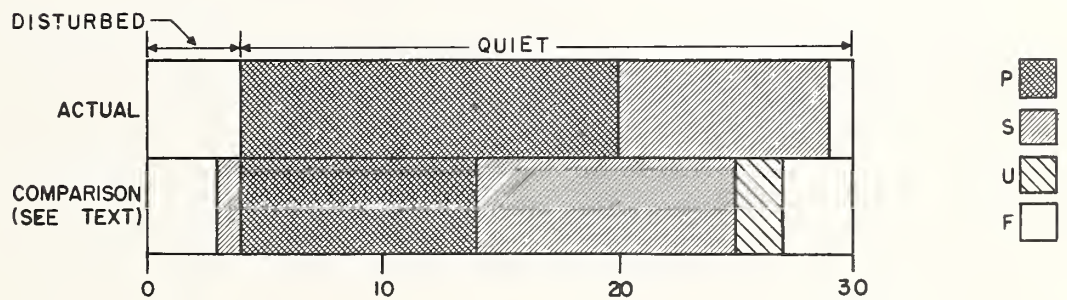
COMMERCE - STANDARDS - BOULDER

NORTH PACIFIC

NOVEMBER 1959

OUTCOME OF ADVANCED FORECASTS

FINAL ESTIMATE



ALERT PERIODS AND SPECIAL WORLD INTERVALS

INTERNATIONAL GEOPHYSICAL COOPERATION 1959
DECEMBER 1959

Issued Day/Time UT Dec. 1959	Advance Geophysical Alert	No.	Worldwide Geophysical Alert	Special World Interval
01/1800	Sacramento Peak Solar Flare 01/1700Z			
01/1600		40		Continue Special World Interval
02/1600		41		Finish Special World Interval
04/1910	Sacramento Peak Solar Flare 04/1820Z			
05/1600		42	Magnetic Storm 05/0659Z	
27/1600		43	Magnetic Storm 26/11XXZ	

COMMERCE - STANDARDS - BOULDER

